# Shoulder Dystocia: Effective Management of an Obstetric Emergency

## A Qualitative Study

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A thesis presented in partial fulfilment of the requirements for the degree of Master of Health Science (Midwifery)

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# TABLE OF CONTENTS

# ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been for the award of any other degree or diploma of a university or other institute of learning.

Signature..... Date.....

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# ABSTRACT

Shoulder dystocia is an obstetric emergency which can result in significant maternal and neonatal morbidity, and in some cases perinatal death. It is an unpredictable event which causes stress and trauma for all concerned. Widely accepted and current management of shoulder dystocia involves performing a set of manoeuvres described in the HELPERR mnemonic, which are taught in emergency obstetric training sessions.

This qualitative interpretive study presents a descriptive and hermeneutic analysis of the narratives of five clinicians who have significant experience in the management of shoulder dystocia. The qualitative descriptive approach is informed by the work of Sandelowski and it incorporates a hermeneutic 'hue' influenced by the work of Heidegger. This approach allowed themes to be identified from straight description. The data was then further analysed using the hermeneutic approach, to bring forth the richness and meaning of the participants' experiences. This research approach facilitated a comprehensive analysis of the data.

The findings of this research are that the management of shoulder dystocia has been influenced by HELPERR, so that practitioners most commonly follow the sequence of the mnemonic, despite the fact that some of the manoeuvres are difficult to perform or remember. Alongside this, the research shows that through their experiences, practitioners have discovered by 'accident' the manoeuvre of axillary traction. They find this manoeuvre not only more effective, but easier to perform in any circumstance.

Another important finding of this research is that there are improved neonatal outcomes when axillary traction is the method of choice for resolving shoulder dystocia. In addition, the research highlights that practitioners who are involved with shoulder dystocia, particularly when the outcome is poor, are at risk of suffering post-traumatic stress and psychological damage, which can result in loss of the practitioner from the profession.

In these ways, this research has contributed to the body of knowledge of shoulder dystocia, and more importantly, provides an alternative and effective strategy for managing shoulder dystocia.

# CHAPTER ONE

# Orientation to the Study

## Introduction

In general terms shoulder dystocia is defined as failure of delivery of the fetal shoulders, either anterior or posterior, or both (Collins & Collins, 2001; Gherman, 2002). It is a potentially life-threatening obstetric emergency which can result in significant maternal and neonatal morbidity and in some cases perinatal death. Shoulder dystocia has been described as the "obstetrician's worst nightmare" (Gherman). This qualitative interpretive study will explore the effectiveness of the current management of shoulder dystocia and find the most effective way of managing the problem so that fewer infants suffer permanent damage or die. It will present a descriptive and hermeneutic analysis of the narratives of five clinicians who have experience in the management of shoulder dystocia.

The research question and aims are defined in this chapter. A range of definitions are presented in order to provide clear understanding of the problem of shoulder dystocia. Justification for the study includes the historical perspective which highlights the fact that shoulder dystocia is a problem that practitioners have faced for centuries, together with a narrative of my own personal experience when faced with the problem as a practicing midwife. The fetal and maternal risks that can ensue are explained. The context in which the study was undertaken is outlined and an overview of the chapters to follow precedes a conclusion to the chapter.

## Research Question and Aims

### *Research Question*

The research question is:

Is the current management of shoulder dystocia using the HELPERR mnemonic strategy (see key terms) effective and are there alternative methods of managing the problem which can optimise the outcomes for all concerned?

### *Research Aims*

The research aims are:

- To identify how practitioners managed shoulder dystocia before the teaching of the HELPERR management strategy, and how that strategy has influenced their practice.
- To identify how effectively the participants were able to manage shoulder dystocia using the manoeuvres described in HELPERR.
- To identify alternative methods of managing shoulder dystocia and compare the effectiveness of a new strategy with that of the HELPERR strategy.
- To determine the risk of injury to the baby when using the HELPERR management strategy compared to the use of an alternative strategy.
- To highlight the effect that shoulder dystocia has on practitioners encountering the problem.

This study will explore the basic principles of the HELPERR management strategy alongside an alternative strategy for resolution of the problem of shoulder dystocia.

## Definition

In order to understand the magnitude of the problem that clinicians face, it is important to understand what *shoulder dystocia* is. The definition of shoulder dystocia continues to be the subject of much debate as there is no classic definition (Beall, Spong, McKay & Ross, 1998). The word *dystocia* is derived from the Greek words meaning 'not moving'. Shoulder dystocia was first described in obstetric and midwifery literature by Fieux (as cited in Gherman, 2002) at the beginning of the 20$^{th}$ century, where 'dystocia' referred to a wide range of difficulties encountered with the delivery of the shoulders. Kerr (1908) described shoulder dystocia as failure of the fetal shoulders to deliver immediately after the delivery of the fetal head. Jellet (1905) recognised shoulder dystocia as the arrest of the shoulders at the pelvic brim, in the pelvic cavity or at the outlet. De Lee (1913) describes shoulder dystocia as delay in delivery of the shoulders due to an unfavorable mechanism such as the shoulders having rotated incorrectly or the anterior shoulder being caught behind the symphysis pubis.

More recent definitions include: any difficulty in extracting the fetal shoulders after delivery of the head (Dignam, 1976), failure of the shoulders to spontaneously traverse

the pelvis after delivery of the fetal head (Smeltzer, 1986), failure of the standard manoeuvre of downward traction to effect delivery of the shoulders (Gross, Shime & Farine, 1987; Resnik, 1980), failure of the shoulders to cross the pelvic inlet (Kochenour, 1991) and 'tight shoulders' (Lewis, Raymond, Perkins, Brooks, & Heymann, 1995). More recently, Beall et al. (1998) have defined shoulder dystocia as prolonged head to body delivery time of 60 seconds or more, and/or the need to use obstetric manoeuvres such as McRoberts position, suprapubic pressure, internal rotational manoeuvres or delivery of the posterior arm to facilitate delivery of the shoulders. Cohen, Penning, Aynsley, Porto and Garite (1999) further define 'mild' shoulder dystocia as needing only the use of McRoberts manoeuvre and/or suprapubic pressure to effect delivery. 'Moderate' shoulder dystocia has been described as requiring fetal rotation manoeuvres such as Rubins II (Piper & McDonald, 1994), whereas the definition of 'severe' shoulder dystocia indicates the use of rotational manoeuvres or extraction of the posterior arm (Cohen et al.).

It appears that there is varying opinion as to what constitutes shoulder dystocia with no consensus on one definition or agreed set of indicators that are called shoulder dystocia. Regardless of the definition shoulder dystocia is a very real problem that practitioners face when caring for women in labour.

## Historical Perspective

Although the term shoulder dystocia has been used since the beginning of the 20th century, difficulty with delivery of the shoulders is described as far back as 1730. Midwifery literature by McClintock (1877) describes the case of an obstetrician William Smellie attending a patient where there was delay in delivery of the shoulders:

> *In the year 1730, I received a sudden call to a gentlewoman in labour; the child's head had been delivered a long time and the midwife had pulled with a great deal of force at intervals. But before I arrived the patient was delivered of a dead child whose shoulders were remarkably large. I have been called by midwives to many cases of this kind, in which the child was frequently lost.* (p. 271)

It is interesting to note that what Smellie describes - which today would be termed shoulder dystocia - is something that he had seen in "many cases". It would appear

from his statement that the perinatal mortality rate was extremely high when shoulder dystocia occurred.

In 1879 Dr Beech was called to attend to Miss Anne Swan during the birth of her second child. When the shoulders became 'stuck fast' he called Dr Robinson to complete the delivery. The written report of the birth follows:

> *It was our desire to deliver the child without mutilation so we passed a strong bandage over the neck of the child, we made strong traction downwards and laterally and finally after a laborious siege we succeeded in delivering our patient of a male child weighing 23¾lbs with a length of 30 inches.*
> (as cited in Gherman, 2002)

It seems that the problem of macrosomia is one which clinicians have faced for centuries. Donald (1974) describes his feelings following a disastrous shoulder dystocia occurring in a macrosomic infant:

> *My sorriest experience of it concerned an elderly primigravida with a 14lb. baby. (Her husband had weighed 15lbs. at birth – an important point to note in postmaturity and one which I overlooked in this case). After rotating and delivering the fetal head with Kielland's forceps I then ran into trouble with impaction of the anterior shoulder and wasted too much time trying to free it and before using the whole hand to bring down the posterior arm. In that hectic fifteen minutes of brute force, of which one could only be ashamed, the baby died. It is a nightmarish situation.* (p. 853)

Today, shoulder dystocia continues to represent the "infrequent, unanticipated, unpredictable nightmare of the obstetrician" (Langer, Berkus, Huff & Samueloff, 1991). This statement would also be true for midwives, and every practitioner can vividly remember at least one shoulder dystocia episode that they have encountered.

## Background to the Research

### *Personal Background*

In accordance with Competency Two of the Midwives Handbook for Practice as a midwife I have a duty to apply comprehensive theoretical and scientific knowledge and

technical skills to provide effective and safe midwifery care (New Zealand College of Midwives, 2005). My interest in exploring the management of shoulder dystocia began when I was working as an independent midwife and found myself in a situation where the application of comprehensive knowledge in relation to shoulder dystocia was severely challenged.

My friend and colleague had been caring for a woman in labour throughout the night so I went to the hospital the next morning to take over from her. At the time of my arrival, the woman - whom I had met on a number of occasions - had been pushing for some time, but to no avail. As a result, the obstetrician had applied the ventouse cup to assist with the birth. After much force and pulling, the head eventually delivered and the ventouse cup came off. The fetal head was pale, the scalp appeared to be full of blood (not just a chignon) and the head literally 'jammed' back up against the symphysis (the turtle sign). I thought I had witnessed - and managed - shoulder dystocias in my career as a midwife, but it was in that instant that I realised I had never witnessed anything of that magnitude before. We were in serious danger of losing the baby.

The obstetrician tried the rotational manoeuvres described in the HELPERR management strategy to no effect, so my colleague and I took over. I applied suprapubic pressure whilst she put her hand into the vagina and grasped the posterior arm. She managed to 'drag' the baby's arm down through the pelvis, but fractured the humerus in the process. We both heard the fracture occur and felt physically sick but, with encouragement, she managed to continue with the traction on the arm because the baby seemed to be moving. Finally, the baby was born, but in dreadful condition. The skilled and experienced paediatrician managed to resuscitate the baby, who subsequently suffered from seizures but recovered with no long-term effects.

Following this experience, my fear of shoulder dystocia increased because this was the first time I had been in a situation where my training had been ineffective. I began to question how I was going to manage if a similar situation arose again, and I started to fear any birth where the baby seemed slightly large. I realised that I needed to face my own fears and began to talk to other practitioners to reflect on their experiences, as well as my own. I also began to research the possible effects of shoulder dystocia and became alarmed at the extent of the damage that shoulder dystocia could incur.

### *Professional Background*

Shoulder dystocia poses a significant and profound risk to the life and well being of the fetus, with high levels of fetal injury, some of which are irreversible. The overall rate of fetal injury following shoulder dystocia is approximately 24.9% (American College of Obstetricians & Gynecologists (ACOG), 1998; Gurewitsch et al., 2003; Jevitt, 2005). Brachial plexus injury is the most common and occurs in 16.8% (Gherman, Ouzounian & Goodwin, 1998a). Brachial plexus injury can result in Erb's palsy which causes the arm to be flail and can subsequently result in permanent bone and shoulder deformities (Terzis & Kokkalis, 2008). Other palsies include Erb-Duchenne and Klumpke's palsy (Gherman, Ouzounian & Goodwin, 1999) which affects the hand. Horner's syndrome (partial ptosis), facial nerve injuries and diaphragmatic paralysis have also been reported (Gherman et al., 1999). Other injuries include bone fractures, the most common being fracture of the clavicle that occurs in 9.5% of babies following shoulder dystocia (Gherman, Ouzounian & Goodwin, 1998b). Fractures of the radius and humerus have also been reported (Jevitt, 2005; McFarland, Langer, Piper & Berkus, 1997).

Severe cases of shoulder dystocia can result in neurological morbidity (Stallings, Edwards & Johnson, 2001) and permanent neurological injury including cerebral palsy, which occurs in up to 13% of infants following shoulder dystocia (Baskett & Allen, 1995). Irreversible central nervous system damage can be as high as 23% (Iffy et al., 2008). Perinatal death occurs in up to 2.6% of infants (Nesbitt, Gilbert & Herrchen, 1998) following shoulder dystocia.

Shoulder dystocia also poses a significant risk of harm to the mother. Physical injuries include vaginal and anal lacerations, bladder atony, uterine rupture and postpartum haemorrhage (Gherman, 2002; Gherman et al., 1997). Psychological trauma with long term effects can also occur (Mashburn, 1988).

The emergency of shoulder dystocia is a significant professional issue which is illustrated by the fact that it is part of the technical skills workshops that the Midwifery Council requires all midwives to attend.

## Justification for Undertaking the Study

The personal and professional background described above lead to me to explore further the risks to both mother and baby and to investigate the issues around shoulder dystocia

in more depth. It was during the course of this investigation that I realised that shoulder dystocia was a problem that had been occurring for centuries and was still unresolved. I had witnessed the devastating physical effects of shoulder dystocia on the baby as well as the psychological trauma for both the parents and practitioners alike. I realised that despite major advances in medicine and midwifery, what I (and others) had experienced, was no different to the practitioners of the 17th and 18th centuries, and that little advance in finding significant resolution to the problem had been made. I decided therefore that shoulder dystocia should be the subject of my research for the Masters in Health Science Degree Programme at Auckland University of Technology as there appeared to be so much more about shoulder dystocia that needed to be researched.

## Context of the Study

This study was conducted in the Auckland Region of New Zealand. Four midwives and one obstetrician who are all working in large tertiary hospitals were interviewed. The exact numbers of shoulder dystocias are not readily available because of inconsistencies in reporting and the process of recording the data. This problem has been recognised by National Women's Hospital, and in their Annual Report of 2007, suggested the introduction of a risk monitoring programme in relation to labour and birth in an attempt to record morbidity such as shoulder dystocia (National Women's 2007). Despite the lack of statistical evidence, there is anecdotally a general impression that practitioners are more likely to encounter shoulder dystocia in Auckland, and in particular some particular parts of Auckland, than in other parts of New Zealand.

In the Auckland region, the Maori population is 11.2%, Pacific Island population is 14.3% and the Asian population is 19% compared to the general population of 11.2%, 6.9% and 9.4% respectively (Statistics New Zealand, 2006). Within the Auckland region there are variations on this ethnic distribution. In Counties Manukau, the Maori population is 17%, Pacific Island population 21% and Asian 17% (Counties Manukau District Health Board, 2008). These demographics are important as they relate in part to some of the risk factors associated with shoulder dystocia with an increased likelihood of shoulder dystocia occurring within certain areas and ethnic groups. Shoulder dystocia is associated with increased body mass index (BMI) (Dildy & Clark, 2000), which is more common in the Pacific Island population and increasingly is becoming an issue for Asian women (Fegan, Glennon & McNamara, 2008; Ramos & Caughey 2005). Furthermore, Maori, Pacific Island and increasingly Asian women are more likely to

suffer from diabetes (Ramos & Caughey; Sunborn et al., 2007) which is a pre-disposing factor for shoulder dystocia (Gherman, 2002). Birth weight of >4kg is associated with shoulder dystocia (Nesbitt et al., 1998; Sokoi & Blackwell, 2003) and is more likely to occur in maternal diabetes. It therefore may be that the higher rate of diabetes and increased BMI encountered in the Auckland area results in a higher rate of shoulder dystocia than seen in other areas of New Zealand.

As previously indicated this statistical data is difficult to collect as the true incidence and severity of shoulder dystocia is not readily reported. There is anecdotal evidence however that that there is a significantly increased number of shoulder dystocias in the Auckland region associated with certain ethnic groups and their health issues. This is the context that gives this research project real importance in terms of its contribution to practice.

## Thesis Outline

The research process and findings are reported in the following chapters:

***Chapter Two: Literature Review***

A review of the literature in relation to the incidence, pathophysiology, causes, pre-disposing factors, risks and outcomes of shoulder dystocia is presented in this chapter. The current management of shoulder dystocia, particularly in relation to the HELPERR management strategy is described.

***Chapter Three: Methodology***

The research methodology and rationale for the qualitative descriptive design with a 'hermeneutic hue' is presented and discussed. The methods are outlined with regard to ethical considerations, recruitment of the participants and provision of information. The process of data collection and analysis with attention to the reliability of this qualitative study are presented and discussed.

***Chapter Four: Shoulder Dystocia and HELPERR***

Analysis of the data presented in this chapter outlines how the participants in the study were originally taught to manage shoulder dystocia, how their practice was influenced by the teaching of HELPERR and the extent to which they were able to manage shoulder dystocia using the HELPERR management strategy.

***Chapter Five: Shoulder Dystocia and Axillary Traction***

Chapter five highlights one of the most important aspects of the data analysis, which is the discovery through the experiences of the participants, of the use of axillary traction for the management of shoulder dystocia. This is an alternative management strategy not included in the HELPERR strategy.

***Chapter Six: Neonatal Outcomes and Shoulder Dystocia***

The neonatal outcomes witnessed and experienced by the participants when shoulder dystocia was managed by the HELPERR strategy versus axillary traction are analysed and described in chapter six.

***Chapter Seven: Effect on the Practitioner***

Chapter seven describes the effects that shoulder dystocia can have on practitioners who experience the problem.

***Chapter Eight: Discussion and Conclusion***

A discussion and summary of the research findings are presented in the final chapter. A new strategy for managing shoulder dystocia is suggested and recommendations for practice, education and research made. The limitations of this study's findings are acknowledged.

## Conclusion

Shoulder dystocia is generally described as failure of the fetal shoulders to deliver after the birth of the fetal head (Collins & Collins, 2001; Gherman, 2002) and as a result can cause significant maternal and neonatal morbidity, and in some cases perinatal death. The various definitions of shoulder dystocia have been described, but there is no consensus or agreement on one definition. The risks of shoulder dystocia for both mother and baby - particularly in the Auckland area - provide context and justification for the study. The similarities between the historical perspective and my own personal experience highlight the fact that the problem of shoulder dystocia is still unresolved today.

# CHAPTER TWO

# Literature Review

## Introduction

Shoulder dystocia is an obstetric emergency which in most cases cannot be predicted (Bruner, Drummond, Meenan & Gaskin, 1999). There is a wide variation in the reported incidence (Gherman, 2002) but as it relates to vaginal birth, both midwives and obstetricians are likely to encounter the problem. Although it may be one of the most alarming problems that clinicians experience, the relative rarity of the problem means that most are unable to become 'expert' in managing the situation (Gherman).

Although shoulder dystocia has been recognised as an obstetric problem since the 18th century, the term shoulder dystocia was first used at the beginning of the 20th century (Gherman, 2002). Despite the hundreds of published studies dealing with shoulder dystocia since that time, there are still many unanswered questions relating to the management in particular, which is currently largely based on empiric reasoning.

This chapter reviews the literature in relation to the incidence of shoulder dystocia, pathophysiology, causes and predisposing factors. The risks and outcomes for both the mother and the baby are identified. Finally, the current practices in relation to management of shoulder dystocia are examined and the HELPERR mnemonic management strategy which is currently taught in obstetric 'skills and drills' sessions is evaluated.

The material for this study was researched manually and electronically. The literature ranged from that written almost a century ago, to contemporary literature, in order to obtain a historical perspective. Literature was obtained by accessing Auckland University of Technology Library, historical books from my own collection, resources from midwifery colleagues and through electronic searching. Databases were accessed through OVID, CINHAL and Medline. Search terms included 'shoulder dystocia', 'labour abnormalities', 'birthing positions', 'McRoberts manoeuvre', 'HELPERR', 'macrosomia', 'perinatal morbidity and mortality' and 'maternal morbidity'.

There is an abundance of literature which relates to the management of shoulder dystocia by using a structured approach to the problem, in particular the HELPERR mnemonic. This appears to start in the mid 1990's which is probably when the teaching of the structured approach began. There are gaps in the literature with relation to other forms of management such as *axillary pressure* - which is rarely mentioned - and *symphysiotomy*, which only seems to be carried out effectively in underdeveloped countries.

## Incidence

The majority of literature suggests that shoulder dystocia complicates 0.2%-3% of all births (Beall et al., 1998; Breeze & Lees, 2004; Draycott et al., 2008; Gherman et al., 2006; Haram, Pirhonen, & Bergsjo, 2002), although some authors report incidences as high as 4% to 7% (O'Connor, 2000; ACOG, 1998). When births were evaluated retrospectively, the incidence of shoulder dystocia is reported as 2.1% (Poggi et al., 2004). Births evaluated prospectively had an incidence rate of 4%, and when an objective definition was used the incidence of shoulder dystocia is reported as high as 14% (Poggi et al.). The lack of a clear definition, discrepancies in reporting and incomplete documentation however suggest that these figures are unreliable (Rice, 1999).

These figures also make no distinction between the rates of shoulder dystocia occurring following normal birth and instrumental delivery, but shoulder dystocia is more likely to occur following vacuum assisted vaginal birth than forceps birth. This is probably because the force exerted by the vacuum cup placed on the fetal occiput may pull the anterior shoulder onto the symphysis pubis whereas the forceps direct the force further down the fetal head and may direct the anterior shoulder underneath the symphysis pubis (Caughey et al., 2005). The incidence of shoulder dystocia when there is a combination of a large fetus, prolonged second stage and midpelvic operative delivery can be as high as 21% (Bendedetti & Gabbe, 1978).

Shoulder dystocia occurs in equal frequency in both primigravid and multigravid women (Nesbitt et al., 1998) and the rate of shoulder dystocia appears to be increasing. MacKenzie et al. (2007) noticed an increase in the rates of shoulder dystocia over a 14 year period from 1991 to 2005 but could not explain the increase in occurrence. Dandolu et al. (2005) also found that the rate of shoulder dystocia had increased ten fold

over a 24 year period from 1979 to 2003. The authors acknowledge that the lack of a clear definition of shoulder dystocia and macrosomia have limited their findings. If newborn weights and the association of weight had been included in the study, greater insight would have been gained into the potential change in the rates of shoulder dystocia.

## Physiology of the Normal Mechanism of the Birth of the Shoulders

In order to understand the pathophysiology of shoulder dystocia it is important to understand the mechanism of normal labour and the passage of the fetal shoulders through the pelvis. Knowledge of the mechanism of normal labour helps the clinicians' understanding of how to resolve the problem and is the basis of the empiric reasoning mentioned above.

In normal labour, the fetal head enters the pelvis (pelvic inlet) in the larger transverse diameter of the pelvis. Descent and internal rotation occurs and the fetal head rotates to the antero-posterior (A-P) diameter which is the widest diameter at the pelvic outlet. As rotation of the fetal head occurs, the shoulders are at pelvic inlet, and they enter the pelvis in the oblique or transverse diameter (the larger diameters at the inlet). Once the fetal head is born, restitution occurs whereby the fetal head externally rotates as the shoulders rotate forwards in the pelvic cavity. This enables the shoulders to be born with the bisacromial diameter in the A-P diameter of the pelvic outlet (McEwan & Johnson, 2004). Delivery of the shoulders is facilitated by making use of the widest diameter at the outlet. The pubic arch then acts as a 'pivot' for the anterior shoulder and the posterior shoulder is born first (Sutton & Scott, 1996).

However, the passage of the fetal shoulders through the pelvis can be variable. Early radiographic studies support the theory of shoulder rotation during normal birth, but this does not occur in all demonstrated cases (Borell & Fernstrom, 1958). The authors found that the shoulders rotate twice during descent in the majority of cases: the bisacromial diameter was in the A-P diameter of the pelvis when they were above the pelvic brim, and that they were in the transverse or oblique diameter as they passed through the brim. On reaching the ischial spines, the bisacromial diameter was commonly in the oblique or transverse diameter but the shoulders rotated in most cases to the A-P diameter at the time of birth. In some cases however, rotation just before

birth did not occur, and the shoulders remained in the transverse or oblique diameter throughout the birth (Borell & Fernstrom1957; Morris, 1955).

## Pathophysiology of Shoulder Dystocia

Shoulder dystocia occurs when either one or both of the shoulders fail to enter the pelvic cavity and there is a persistent A-P location of the fetal shoulders at the pelvic brim (Gherman, 2002). This may be a result of increased resistance between the fetus and the vaginal wall (e.g. macrosomic fetus) as the fetus has a large chest relative to the biparietal diameter or where the fetal trunk and shoulders fail to rotate (e.g. precipitous labour) at the level of the midpelvis (Gherman).

In shoulder dystocia, the shoulders most commonly remain in the A-P diameter at the pelvic brim and the posterior shoulder descends below the sacral promontory to lie in the hollow of the sacrum while the anterior shoulder becomes impacted behind the symphysis pubis (Hernandez & Wendel, 1990; McEwan & Johnson, 2004). This is known as *unilateral shoulder dystocia* (O'Leary, 1992) and has also been referred to as the *low form* of shoulder dystocia (Pecorari, 1999).

The less common and more severe form is *bilateral shoulder dystocia* (O'Leary, 1992), which occurs when both shoulders remain above the pelvic brim. As in the case of unilateral shoulder dystocia, the anterior shoulder becomes impacted behind the symphysis pubis, but the posterior shoulder does not enter the pelvic cavity and becomes impacted behind the sacral promontory (O'Leary). This has also been referred to the *high form* of shoulder dystocia (Pecorari, 1999).

Clinical signs have been used to identify cases of *true shoulder dystocia*. Dignam (1976) described true shoulder dystocia occurring when the shoulders are held high in the pelvis and the head is pulled tightly back against the perineum. This is known as the '*turtle sign*' (analogous to a turtle withdrawing into its shell). Following delivery of the fetal head the fetal neck is placed under significant stretch and the head is drawn up tightly against the perineum (Baxley & Gobbo, 2004; McEwan & Johnson, 2004). The turtle sign is caused by reverse traction from the anterior shoulder impacted behind the symphysis and the posterior shoulder remaining behind the sacral promontory (Sweet, 1997). The turtle sign occurs in the bilateral form of shoulder dystocia and is due to the

stretching of the neck, but is not evident in the unilateral form as one shoulder has entered the pelvic cavity and some degree of restitution can take place (Pecorari, 1999).

It is important to recognise the turtle sign as an indication of the most severe (bilateral) form of shoulder dystocia. In this case, the overwhelming temptation and response is to pull harder. Clinicians refer to this as *downward traction,* as the fetal head is pulled downward in relation to the maternal pelvis i.e. towards the sacrum. In fact, the shoulders are still in the persistent A-P location at the pelvic brim (Gherman, 2002), so the traction that is being applied on the fetal head is lateral in relation to the fetal trunk. It is this excessive lateral traction that causes damage to the nerve roots which result in Erb-Duchenne palsy, Klumpke palsy or Horner's syndrome (Romoff, 2000).

By understanding the physiology of the normal mechanism of the birth of the shoulders, clinicians are able to gain a deeper understanding of the pathophysiology of shoulder dystocia. This deeper understanding may lead to an individualised approach to shoulder dystocia and implementation of strategies to resolve the problem that are less harmful to the baby.

## Causes/Predisposing Factors

Almost 50% of shoulder dystocias occur in infants weighing less than 4kg (Romoff, 2000) but there is significant evidence to suggest that the rate of shoulder dystocia increases as birth weight increases with rates of 0.6%-1.4% in infants weighing 2.5kg-4.0kg and 5%-9% in infants weighing more than 4kg (Nesbitt et al., 1998; Sokoi & Blackwell, 2003).

Fetal macrosomia is a significant risk factor for shoulder dystocia (Acker, Sachs & Freidman, 1986). It is commonly defined as birthweight of 4kg or more (Pates, McIntire, Casey & Leveno, 2008) but perhaps a more stringent definition is a birthweight of 4.5kg or more (Gonen, Spiefel & Abend, 1996). Both excessive maternal weight and excessive weight gain in pregnancy are associated with macrosomia (Johnson, Longmate & Frentzen, 1992) and so the risk of shoulder dystocia increases in these women (Acker et al., 1986). Fetal macrosomia is also more likely to occur in multiparous women, particularly in those women with more than three children (Jevitt, 2005).

Diabetes mellitus is a major risk factor for shoulder dystocia which is 70% more likely to occur in women with diabetes (Gherman, 2002). This is because the incidence of macrosomia and large for gestational age infants is greater in women with diabetes mellitus (Modanlou, Komatsu, Dorchester, Freeman & Bosu, 1982). It has also been shown that the measurements of infants of women with diabetes differ from the general population in the chest-to-head and shoulder-to-head ratios (Modanlou et al.). The infant of the diabetic mother has increased shoulder and truncal fat, with the shoulders growing disproportionately larger than the fetal head (Cohen et al., 1999). It is possible that the body configuration of the fetus may in itself be more important than macrosomia as the increased chest, trunk and bisacromial diameter measurements prevent the normal rotation of the fetal shoulders (Gherman).

There is also a greater incidence of shoulder dystocia in male fetuses as there is a relationship between the male fetus and macrosomia (Geary, McParland, Johnson & Stronge, 1995). In general the birthweight of male newborns tends to be greater than that of the female newborn (Berkus, Conway & Langer, 1999) and it has been suggested that there may be anthropomorphic differences between male and female newborn dimensions (as in infants of the diabetic mother) which make the male fetus more at risk of shoulder dystocia (Dildy & Clark, 2000).

Larger fundal height measurements - greater than 40cm - and postdates pregnancy have been associated with shoulder dystocia probably due to an increase in fetal size in these circumstances (Campbell, Ostbye & Irgens, 1997).

Prior shoulder dystocia is a significant risk factor with rates of 9.8%-16.7% recurrence (Cohen et al., 1999; Lewis et al., 1995). This is probably related to the fact that the underlying risks for fetal macrosomia - such as diabetes and maternal obesity - are present in subsequent pregnancies and possibly even to greater effect (Dildy & Clark, 2000). Previous infant with macrosomia is also a risk factor for shoulder dystocia in subsequent pregnancies probably because the underlying risks continue into subsequent pregnancies (Dildy & Clark).

Abnormalities in the progress of labour are associated with shoulder dystocia (Mehta, Bujold, Blackwell, Sorokin & Sokol, 2004) and the risk of shoulder dystocia significantly increases if there is a prolonged second stage or midpelvic operative

delivery (Benedetti & Gabbe, 1978). Prolonged second stage of labour of more than 2 hours and arrest disorders are significant risk factors (Gemer, Bergman, & Segal, 1999; Mehta et al.). Shoulder dystocia is also significantly more likely to occur following operative vaginal delivery (Mocanu, Greene, Byrne & Turner, 2000) and is more likely to occur following vacuum extraction (3.5%) than forceps delivery (1.5%) (Caughey et al., 2005). Oxytocin augmentation of labour has been associated with shoulder dystocia (Rouse, Owen, Savage & Hauth, 2001) but this is probably associated with the use of oxytocin in women with labour abnormalities and fetal macrosomia (Dildy & Clark, 2000).

Early research suggests that abnormalities of the maternal pelvis are associated with shoulder dystocia due to contraction of the pelvis or an abnormality in the shape of the coccyx (Seigworth, 1966). This has not been reported in recent years probably because of the disappearance of radiological (X-Ray) and clinical pelvimetry in obstetric practice today.

Other risk factors which have been suggested are advanced maternal age (Langer et al., 1991) but this is probably associated with other age dependent factors such as increasing maternal weight or diabetes (Dildy & Clark, 2000). Short maternal stature, maternal birthweight, and excessive moulding of the fetal head have also been suggested but not proven (O'Leary & Leonetti, 1990).

The literature suggests that the main causes of shoulder dystocia relate to fetal macrosomia and maternal diabetes (Acker et al., 1986; Gherman, 2002). Independent risk factors such as advancing maternal age and maternal obesity may also be associated with the underlying risks for fetal macrosomia and diabetes in general (Dildy & Clark, 2000).

## Risks to the Fetus

The overall rate of fetal injury following shoulder dystocia is approximately 24.9% with brachial plexus injury being the most commonly reported (ACOG, 1998; Jevitt, 2005). Large variations in brachial plexus injury rates have been reported from 4%-59.1% (Baskett & Allen, 1995; Gherman et al., 1998a; Gilbert, Nesbitt & Danielsen, 1999; Gurewitsch et al., 2004; Mortimore & McNabb, 1998; Raio et al., 2003) but perhaps the rate of 16.8% as found in a large retrospective study is more realistic (Gherman et al.).

The right arm is more commonly affected because the most common fetal position of left occipito-anterior leaves the right shoulder impacted behind the symphysis pubis (Gherman et al.).

Approximately 80% of palsies following shoulder dystocia involve the nerves of the cervical roots 5-6, causing Erb-Duchenne palsy. The involvement of the nerve roots C8-T1 cause Klumpke's palsy which affects the hand and can be intermediate or complete (Gherman et al., 1999). Horner's syndrome (damage to the nerve roots of T1-T3 causing partial ptosis), facial nerve injuries and diaphragmatic paralysis have also been reported (Gherman et al.).

Bone fractures - most commonly fracture of the clavicle - occurs in approximately one third of brachial plexus injuries, with clavicular fracture occurring in approximately 9.5% of all shoulder dystocias (Gherman et al., 1998b). Clavicular fractures commonly heal without complication but may be associated with injury to the lung or underlying vascular structures (Jevitt, 2005).

Radial fractures of the humerus have been associated with the manoeuvres used to alleviate shoulder dystocia (McFarland, Langer, Piper & Berkus, 1997), with rates of approximately 4.2% of all shoulder dystocia births (Gherman et al., 1998b). A case of a spiral fracture of the radius has been reported following removal of the posterior arm (Thompson, Satin, & Gherman, 2003). Humeral fractures, however, usually heal without complication (Jevitt, 2005) but can be deeply distressing to the parents.

Severe cases of shoulder dystocia can result in neurological morbidity and is associated with lower mean fetal arterial blood gas parameters (Stallings et al., 2001). Once the fetal head is delivered the blood pH level has been shown to drop at the rate of 0.04units per minute until delivery of the fetal trunk (Wood, Ng, Hounslaw & Benning, 1973) therefore brain injury is more likely to occur if the interval between head to body delivery is prolonged (Gurewitsch, 2007). If there is a tight nuchal cord, compression occurs causing even more rapid deterioration of the fetus (Flamm, 1999).

Birth asphyxia requiring resuscitation occurs in 24%-43% of infants (Mortimore & McNabb, 1998; Nesbitt et al., 1998) depending on the severity of the shoulder dystocia. Permanent neurological injury including cerebral palsy occurs in up to 13% of infants

following shoulder dystocia (Baskett & Allen, 1995). However, Iffy et al. (2008) suggest that irreversible central nervous system damage can be as high as 23% following shoulder dystocia including permanent brachial plexus damage.

Perinatal death occurs in up to 2.6% of infants (Nesbitt et al., 1998) with shoulder dystocia and death can occur as a result of shoulder dystocia even when the head to body delivery interval is less that 5 minutes (Hope et al, 1998; Stallings et al., 2001). This may be a result of compression of the fetal neck resulting in cerebral venous obstruction, excessive vagal stimulation and bradycardia that causes clinical deterioration disproportionate to the duration of hypoxia (Hope et al., 1998). The Confidential Enquiry into Stillbirths and Deaths in Infancy (1998) of Great Britain reported that 47% of infants died within 5 minutes of the head being delivered.

The literature demonstrates that shoulder dystocia poses a significant and profound risk to the life and well being of the fetus, with high levels of fetal injury, some of which are irreversible. Interestingly, the level of damage that can occur is disproportionate to the duration of the hypoxia that results from the delay between the head to body delivery interval (Hope et al., 1998). Changes in practice that facilitate rapid delivery of the infant together with a reduction in birth trauma are needed to ensure that the risk to the fetus is reduced and that outcomes are optimal.

## Risks to the Mother

Whilst the fetal risks of shoulder dystocia are very significant there are also risks to the mother. Maternal morbidity associated with shoulder dystocia includes vaginal lacerations (19.3%), cervical tears (2%), bladder atony and uterine rupture (Gherman, 2002). Post partum haemorrhage rates are also increased with reports of up to 11% occurrence (Gherman et al., 1997). Anal sphincter trauma is also more likely to occur (Gurewitsch et al., 2004; McFarland, Langer, Piper, & Berkus, 1996) with fourth degree laceration rates as high as 3.8% reported (Gherman et al.).

Gherman, Ouzounian, Incerpi and Goodwin (1998) report a case of symphyseal separation and transient femoral neuropathy following the use of McRoberts manoeuvre. There are also case reports of bladder injury, symphysiotomy, low transverse hysterotomy and hysterectomy following rupture of the uterus from Bandl ring (Sandmire, 2004).

The literature demonstrates the physical risks of shoulder dystocia in relation to the mother, particularly in relation to vaginal and anal sphincter trauma. It must be acknowledged however, that one of the main risks to the mother must be the psychological trauma that results from being subject to emergency procedures and actions, physical trauma and possible long term sequelae for her baby (Mashburn, 1988).

## Management of Shoulder Dystocia

Current management of shoulder dystocia involves the use of various manoeuvres to alleviate the problem yet there is a lack of randomised controlled trials or experiments that have directly compared their effectiveness. Such trials however would be almost impossible to design and unethical due to the potential risks to the life of the fetus. In delivering a baby with shoulder dystocia the clinician must do everything possible to alleviate the problem and not be restricted to one defined set of actions as would be required in a randomised controlled trial.

Retrospective reviews have reported success rates associated with McRoberts and symphyseal pressure manoeuvres (Gherman et al., 2006) but the only shoulder dystocia manoeuvre that has been evaluated objectively is McRoberts manoeuvre (Gurewitsch et al., 2005).

There are authors who recommend a prompt, well co-ordinated sequence of manoeuvres to alleviate the problem (Gherman et al., 1997; Neill & Thornton, 2000; O'Connor, 2000) such as those described by the HELPERR mnemonic (Advanced Life Support in Obstetrics (ALSO), 2000; Baxley & Gobbo, 2004) yet there is no clear evidence base for the order of use of these manoeuvres (ACOG, 1998; Simpson, 1999). Despite this lack of evidence the type and sequence of manoeuvres that should be employed are taught in emergency obstetric skills training using a systematic shoulder dystocia 'drill' such as those described by the HELPERR mnemonic (ALSO; Camune & Brucker, 2007; Royal College of Obstetricians and Gynaecologists (RCOG), 2005).

### *The HELPERR mnemonic:*

**H** – *Call for **H**elp*. In all cases this would be necessary and the appropriate equipment and personnel should be available including midwives, obstetrician, anaesthetist and neonatologist.

**E** – ***E****valuate for Episiotomy*. Shoulder dystocia is considered a 'bony' problem rather than a 'soft tissue' problem, so although episiotomy may be useful to allow the clinician easier access to perform internal manoeuvres (Gurewitsch et al., 2004), episiotomy alone will not alleviate the problem. Performing an episiotomy in these circumstances however is associated with a seven-fold increase in the rate of severe perineal trauma without any improvement in neonatal outcome (Gurewitsch et al.).

**L** – ***L****egs*. Placing the legs in *McRoberts position* involves abducting, flexing and rotating the maternal hips outwards so that the maternal thighs are on the abdomen. This results in straightening of the sacrum relative to the lumbar spine and superior rotation of the symphysis pubis (Gherman et al., 2006; Gurewitsch, 2007). McRoberts position can increase the pelvic outlet by up to 1cm (Poggi et al., 2004). It also is associated with an increase in uterine pressure and strengthening of the contractions (Buhimschi, Buhimschi, Malinow & Weiner, 2001) and with reported success rates of 42%, is an effective manoeuvre (Gherman et al., 1997). The degree of hyperflexion required to achieve the required changes may not be possible in very obese women.

**P** – ***P****ressure*. Suprapubic pressure applied with the flat of the hand behind the anterior shoulder in a downward and lateral direction - so that the anterior shoulder is pushed toward the fetal chest - aims to push the fetal shoulder into a lateral position and reduce the bisacromial diameter, enabling the shoulder to slip under the symphysis pubis (RCOG, 2005). At the same time the birth attendant is advised to apply gentle downward traction to the fetal head to assist the anterior shoulder in slipping under the symphysis pubis. Suprapubic pressure performed along with McRoberts manoeuvre improves success rates to 54.2% - 58% (Gherman et al., 1997; Gherman et al., 1998b). There is no difference between the efficacies of either rocking or continuous suprapubic pressure movements (RCOG). Suprapubic pressure is also known as *Rubins I manoeuvre* (ALSO, 2000).

**E** – ***E****nter*. Internal rotation manoeuvres are designed to manipulate the shoulders into the larger oblique diameter of the pelvis or a full 180-degree rotation and under the maternal symphysis pubis (Baxley & Gobbo, 2004). In *Rubins II manoeuvre* two fingers are inserted into the vagina behind the anterior fetal shoulder, which is then pushed towards the fetal chest (ALSO, 2000). The aim is to reduce the bisacromial diameter by adducting the shoulder (Baxley & Gobbo). If this manoeuvre fails then two

fingers of the opposite hand are placed on the anterior aspect of the posterior shoulder and pressure is applied upwards to abduct the posterior shoulder in an upwards direction to follow the circumference of the pelvis. This known as *Woods screw manoeuvre* (Baxley & Gobbo). Rubins II and Woods screw manoeuvres can be combined to increase the force applied in order to create a more effective rotation of the shoulders (Baxley & Gobbo). If Rubins II and Woods screw manoeuvres fail then *reverse Woods screw manoeuvre* can be attempted. In this case the clinicians' fingers are placed on the back of the posterior shoulder and the shoulder is adducted and rotated into the oblique pelvic diameter. The rotation in this case is in the opposite direction from the Woods screw manoeuvre (ALSO).

Rotational manoeuvres have not been objectively evaluated (Gurewitsch et al., 2005), but the Woods screw manoeuvres are associated with a seven fold increase in the rate of $4^{th}$ degree perineal laceration (McFarland et al., 1997).

**R** – ***R****emoval of the Posterior Arm.* In this manoeuvre the posterior arm is located, the elbow flexed and the forearm delivered across the fetal chest in a sweeping motion. This reduces the bisacromial diameter and the fetus often spontaneously rotates and the anterior shoulder can slip under the symphysis pubis (Baxley & Gobbo, 2004, ALSO, 2000). Removal of the posterior arm has not been objectively evaluated (Gurewitsch et al., 2005), but is associated with fracture of the humerus with reports of as high as 12% (Gherman et al., 1998b) together with a 12 fold increase in the risk of $4^{th}$ degree perineal laceration (McFarland et al., 1997).

**R** – ***R****oll.* Rolling the woman into the all-fours position (also known as the *Gaskin manoeuvre*, named after the midwife Ina May Gaskin) has been reported as being successful in alleviating shoulder dystocia in up to 83% of women (Bruner et al., 1999). Early radiographic studies have indicated that the pelvic dimensions increase when a woman moves out of the dorsal recumbent position with the true obstetric conjugate increasing by up to 10mm and the pelvic outlet increasing by up to 20mm (Borell & Fendstrom, 1957). The advantage of this manoeuvre is that the rotational manoeuvres can be instituted following the 'roll'. Despite the effectiveness of this manoeuvre, it is the last to be mentioned in the HELPERR mnemonic.

### *Alternative Manoeuvres*

*The Zavanelli Manoeuvre* – cephalic replacement. This manoeuvre involves reversal of the birth process by derestitution, flexion and replacement of the fetal head into the vagina. Tocolytics have been used to facilitate the process and the baby is then delivered by caesarean section (Sandberg, 1999). Success and complication rates for this procedure vary widely (Gherman, 2002; Spellacy, 1995). Performance of the manoeuvre is complicated by clinicians' lack of experience in performing this in stressful emergent situations (Gherman et al., 2006). Injuries associated with cephalic replacement include Erb- Duchenne palsy, seizures, paresis of the lower limbs, quadriplegia, delayed motor development, cerebral palsy and neonatal death (Sandberg). Reported maternal complications include uterine infection resulting in hysterectomy, and rupture of the vagina and uterus (Sandberg).

*Symphysiotomy* – division of the pubic symphysis to increase the pelvic dimensions. The woman is placed into an exaggerated lithotomy position, the bladder is catheterised and the urethra laterally displaced. The symphysis is then incised with a scalpel blade which results in an absolute increase in pelvic dimensions (Kwek & Yeo, 2006). Maternal complications of this procedure include laceration of the bladder neck and proximal urethra, infection, blood loss, urinary incontinence, long term pain and difficulty in walking (Goodwin, Banks, Millar & Phelan, 1997; Kwek & Yeo). Poor neonatal outcome is also associated with symphysiotomy, in particular anoxic brain injury resulting in death (Goodwin et al.). In underdeveloped countries symphysiotomy is much more commonly used especially as an emergency procedure for entrapment of the aftercoming head of the breech presentation. A fetal survival rate of 80% with apparently little maternal morbidity (Menticoglou, 1990) suggests that familiarity with the procedure reduces complication rates even in the emergency situation.

*Hysterotomy or Upper Segment Uterine Incision* – opening of the uterine cavity allows more direct pressure to be applied in order to rotate the fetal shoulders or dislodge the anterior shoulder to facilitate vaginal delivery. This has not proven to be effective, with very poor neonatal outcomes (Goodwin et al., 1997).

*Cleidotomy* – deliberate fracture of the clavicle to reduce the bisacromial diameter. This can be done by applying upward digital pressure on the fetal clavicle or surgical division using either a blade or a pair of scissors. Cleidotomy as a management strategy

for shoulder dystocia has not been reported in recent literature as it is difficult to perform and there are serious risks of damage to the underlying pulmonary and vascular structures (Gherman et al., 2006). It may be that this procedure is best reserved for management of shoulder dystocia after fetal death. (Kwek & Yeo, 2006).

*Axillary pressure* – the attendant's hand is passed along the posterior vaginal wall, hooking the fingers into the posterior axilla and traction is applied. Axillary pressure has been described as a management technique in early literature (Corkill, 1948; Donald, 1974; Myles, 1975), but there are no evaluations of this manoeuvre and it is not mentioned in current literature.

*Fundal Pressure* – application of pressure at the level of the fundus in order to create an expulsive force. There are no recent evaluations of this measure but it is generally believed that this manoeuvre further impacts the anterior shoulder against the symphysis pubis (Gherman et al., 2006). It is associated with neonatal complications such as a higher incidence of Erb - Duchenne palsy, thoracic and spinal cord injury and orthopaedic and neurological damage (Gherman et al; Gherman & Goodwin, 1998).

## Conclusion

Shoulder dystocia is an unpredictable obstetric emergency (Bruner et al., 1999). There is, however, no agreed definition of shoulder dystocia (Beall et al., 1998). This lack of definition has an impact on the reported rates, with resulting wide differences in incidence and reported rates of neonatal and maternal morbidity and mortality (Beall et al; Draycott et al., 2008; Gherman et al., 2006; Haram et al., 2002; O'Connor, 2000). It appears that the rates of shoulder dystocia are increasing (Dandolu et al., 2005; MacKenzie et al., 2007) but the difficulties with definition of the problem cause wide variations in the reported rates (Rice, 1999).

Fetal macrosomia and maternal diabetes are the most common risk factors for shoulder dystocia (Acker et al, 1986; Gherman, 2002). Other risk factors such as fetal body dimensions (Gherman), prior shoulder dystocia (Cohen et al., 1999; Lewis et al., 1995), maternal obesity (Dildy & Clark, 2000) and advancing maternal age (Langer et al., 1991) may not be risk factors alone but may be associated with the underlying risks for fetal macrosomia and diabetes in general (Dildy & Clark).

There is increasing evidence that shoulder dystocia is more likely to occur following ventouse delivery than following forceps delivery (Caughey et al., 2005) which needs to be taken into consideration when instrumental vaginal delivery is required. Care and consideration of the problem also needs to be acknowledged when the progress of labour is slow (Mehta et al., 2004).

There is no doubt as to the magnitude of the risks to the fetus following shoulder dystocia, with high levels of fetal injury possible, some of which are permanent (ACOG, 1998; Jevitt, 2005). Hypoxia causing permanent brain injury and death occurs in a significant number of fetuses (Nesbitt et al., 1998; Stallings et al., 2001). The risks to the mother - both physical and psychological - are also significant (Gherman et al., 1998; Gurewitsch et al., 2004; Mashburn, 1988; McFarland et al., 1996; Sandmire, 2004). As the occurrence of shoulder dystocia appears to be increasing (Dandolu et al., 2005; MacKenzie et al., 2007) the impact on families and clinicians will become greater.

The literature encourages a structured and systematic approach to alleviating shoulder dystocia by using the HELPERR mnemonic (ALSO, 2000; Baxley & Gobbo, 2004; RCOG, 2005) despite the fact that there is no clear evidence base as to the order in which the manoeuvres should be instituted (ACOG, 1998; Simpson, 1999). The manoeuvre which had been evaluated as being the most effective - the ‘roll’ (Bruner et al., 1999) - is the last to be implemented when following the mnemonic. This could have a detrimental effect on both mother and baby, as the more manoeuvres that are required to alleviate the problem, the worse the outcome for both mother and baby (McFarland et al., 1996).

In the developed world clinicians lack experience and familiarity with symphysiotomy resulting in a high complication rate for this procedure (Goodwin et al., 1997). Hysterotomy and cleidotomy are also seldom used, thus clinicians are not competent in performing these procedures (Gherman et al., 2006).

The literature review identifies the problems encountered by clinicians and the reasons why these problems occur. The subsequent poor outcomes of these difficulties are also identified. The need for a manoeuvre that is simple to recall, easy to perform, reduces

the head-to-body delivery interval and either minimises or alleviates fetal injury is therefore necessary to alleviate the problem and optimise outcomes for all concerned.

# CHAPTER THREE

# Methodology

## Introduction

The qualitative methodology that informs this research is presented in this chapter. The rationale behind the choice of the methodology is also explained, along with the method used when undertaking the research. Qualitative research methods are particularly useful when describing a phenomenon. This is because interpretive description facilitates understanding by providing a process by which reflection and critical examination of the phenomenon under study can take place. This serves to guide and inform practice (Hinds, Chaves & Cypess, 1992).

The process I undertook to ensure trustworthiness and rigour of this study will be outlined. Ethical considerations, recruitment of the participants, the reason for their selection, consent, anonymity and confidentiality are discussed. The process of identifying themes and the key to data interpretation will also be described. Alongside this I will show how my understanding was enhanced by obtaining feedback on the data analysis and how I addressed the challenges that arose during the research process.

## Research Methodology and Rationale

The methodological approach of *qualitative descriptive* initially informed this research. This design is used when the researcher sets out to gather information about situations as they occur and when straight description is needed (Burns & Grove, 2001; Sandelowski, 2000). This type of design is particularly useful when researchers want to know the 'who', 'what', 'where' and 'how' of something (Neuman, 2003; Sandelowski). This research study is centered on the 'how' and 'what' in regard to the management of shoulder dystocia and to this end a qualitative descriptive design appeared to be particularly useful.

The use of a qualitative descriptive design means that data rich in the detail of the management of shoulder dystocia could be gathered and analysed. The approach of the research is inductive so that themes were able to be identified from the data and analysis could be carried out using thematic analysis. The putting of data into categories and identifying themes reveals the problems and practices associated with shoulder dystocia

and make it possible to uncover the participant's management of the problem (Seamen, 1987).

Following collection, transcription and initial analysis of the data, it became evident that straight description and categorisation of the data as described above did not facilitate the depth of interpretation required in order to elucidate the meaning of the participants experiences. Interpretive description is designed to create ways of understanding clinical phenomena by providing an account using reflection and critical examination to guide and inform practice. This study required interpretation that involved 'unpacking' of the descriptive data to uncover what was informing practice, and to allow the events described to be fully understood. Sandelowski (2000) claims that while qualitative interpretive description is especially amenable to answering questions of special relevance to practitioners, this qualitative approach can also be influenced by other approaches which she describes as 'hues' or 'overtones'. During the course of the research, the data collection and analysis began to inform one another, and thus the shape and direction of the inquiry began to evolve revealing the need for a hermeneutic 'hue'.

### *The 'Hermeneutic Hue'*

Heidegger proposed that the hermeneutic method is the most appropriate approach for the study of human action (Heidegger, 1962). It involves the description and study of human behaviour based on practical understanding rather than theoretical assumptions. Hermeneutics is an interpretation of textual language, with hermeneutic analysis focusing on texts as a research data source (Byrne, 2001). This type of analysis allows a deep understanding of the material by disclosing the experience in all of its richness and greatest depth (van Manen 1990, p.20). The process of hermeneutics which brings forth the richness of meaning and experience meant that the data in this study was further analysed using a 'hermeneutic hue'. Using a qualitative descriptive approach with a 'hermeneutic hue' in this particular research study allowed more comprehensive analysis of the data.

## Ethical Considerations

The participants were chosen through purposive sampling as my professional networks and knowledge enabled me to know who was most likely to have had significant experience of shoulder dystocia. When considering the ethical aspects of this study it

was important to adhere to the key principles of partnership including informed and voluntary consent, minimisation of risk, truthfulness and cultural safety. One of the fundamental principles of research is that of *beneficence* (Polit & Beck, 2006): the right of the participants to be protected from harm and discomfort. In order to ensure their safety, the participants were informed that if at any time they were to experience any discomfort as a result of sharing their thoughts, ideas and previous experiences, then the interview would cease. I would then provide them with the appropriate contact numbers and places to access support, debriefing or counselling via the Health and Counselling Services at AUT or through the Employee Assistance Programme at their workplaces.

Participants were provided with information regarding the interview (Appendix B) and informed that their participation was purely voluntary, and that they were able to withdraw at any time prior to collection of the data. Their confidentially and anonymity was guaranteed.

Ethical approval for this study was granted by Auckland University of Technology Ethics Committee (AUTEC) on 11th October 2007 (Appendix C).

## Participants in the Study

The criteria for inclusion into the study were that the participants were midwives and obstetricians who had been in current practice for the last five years in the Auckland region. The reason for this is because the relatively low rates of shoulder dystocia deem that practitioners are unable to become expert in managing the problem (Gherman, 2003). It was important therefore to select participants who had been involved with and managed shoulder dystocia on a number of occasions. Through my professional knowledge of the subject population I was aware that some midwives and doctors were more 'expert' than others in the field of interest and so were invited to participate in the study.

Although my original intention was to recruit up to10 study participants, after collection of data from five of the participants, and discussion with my supervisors, it was evident that I already had a wealth of data because themes had become apparent. Even though the sample size was small, small numbers are deemed to be adequate to capture a full range of themes in relation to the phenomena of interest (Polit & Hungler, 1991).

Furthermore, the information collected on the subject under investigation was rich in the participants' experiences and viewpoints (Sandeloswki, 2000). This purposive sampling approach enabled the best informants to be selected so that those who were best able to provide information about shoulder dystocia were interviewed. This allowed the generation of knowledge that not only answered the research question, but also added to the body of knowledge regarding management of shoulder dystocia.

## Selection and Recruitment of the Participants

Four of the participants interviewed were Registered Midwives with a range of midwifery experience from 8 years to over 40 years. The other participant was a Specialist Obstetrician with more than 10 years obstetric experience. All of the participants have been responsible for the care of women in labour, and have worked in the past five years in a tertiary hospital setting within the Auckland Region.

The participants were invited by me to join the study. I discussed the purpose of the study and if the participants were interested in finding out more about their possible involvement they were sent an information/invitation letter (Appendix B). The letter invited them to participate in the study because of their level of experience and expertise in managing shoulder dystocia. Invite by letter also enabled them to choose not to participate in the study should they wish. Information outlining the purpose of the study was included in the letter, stating clearly that it intended to identify the best and most appropriate strategies to manage shoulder dystocia so that neonatal and maternal outcomes may be improved.

The information sheet included an explanation of what participation in the project would involve and that the interview would take approximately one hour, plus any time it took for the participants to review their transcripts and delete any parts they did not wish included in the study. They were advised that the interview would be designed to: identify their experiences and strategies for managing shoulder dystocia; explore their views as to what had an impact on their practice; and identify the clinical procedures they used and those they had observed as to being the most effective way to manage shoulder dystocia. The participants were informed that the interviews would take place at a mutually agreed, private and convenient location and that the interview would be audio-taped, later transcribed and returned to them for deletion of any material they wished.

An explanation of how participant discomfort and risk would be minimised was included, with the participant reassured that the interview would cease should any discomfort take place. They were also advised that if, following the interview, they wanted to retract any information, that information would be deleted. They were also informed that if the interview raised issues or memories, that for them needed further exploration or debriefing, that they would be provided with the appropriate support contact details. This situation did not arise. They were also informed that while there might be no immediate benefit to them by participating in the study, it could be rewarding to have had their opinions heard, and personally contribute to the body of knowledge regarding the management of shoulder dystocia.

The participants were informed that the information they provided for the study would form the basis of my Masters thesis and that a final report would be made available to them. They were also advised that the material gathered may be also be used for conference presentations or journal publications.

The privacy of the participants was assured and they were informed that the tapes and transcripts would remain confidential, with a false name used on all transcripts and reports. On completion of the study, the tapes would be returned to the participant or destroyed, whichever they preferred. The participants were also reassured that the information they provided would not be used outside of the research project.

The participants were given a contact phone so that they had the opportunity to ask questions and receive an immediate response at all times. Following their consideration of inclusion into the study the participants gave their consent by completing and returning the written consent form (Appendix D). Once the completed consent form was received, the participants were contacted by phone or email (at their request) in order to arrange an interview date, time and place.

## Participants Rights

As the participants were personally invited to join the study I had to be extremely careful to ensure that they did not feel pressurised to participate. Therefore, at the start of each interview, I discussed again their willingness to participate in the study and gave them the opportunity to withdraw at any time prior to collection of the data. I was

working as a Midwifery Educator at the time of the interviews and so there was no dependent relationship between myself and any of the participants.

The researcher has a duty to protect the participants in the study from discomfort and harm and to bring about the greatest possible benefits (Burns & Grove, 2001). It was important therefore that, prior to the interview, I reiterated the information they were originally provided with (Appendix B) paying particular attention to their rights to anonymity and confidentiality through protection of their identities and places of work. Furthermore, I gave assurance that signed consent forms, data and tapes would be kept in a secure, locked place and either returned or destroyed six years after completion of the study. In order to uphold the participants' rights to protection from harm they were reminded of their right to cease the interview at any time and their right to provision of counselling or support at the request of which I would provide contact details. All of the ethical principles described in the information sheet (Appendix B) were upheld in order to protect the rights of the participants.

## Data Collection

### *The Interview Process*

The interviews were arranged following receipt of the signed consent forms. The purpose of interviewing is that the information given is in-depth and wide-ranging with a deeper understanding sought via analysis of the data. Exploration of the participants' experiences through in-depth interviewing allows the researcher to gather data so that the construction of a phenomenon can be developed (Polit & Beck, 2006). This is good qualitative data (Sandelowski, 2000).

This was the first time I had conducted interviews for research purposes and I was initially apprehensive. My supervisor conducted a practice interview with me as the interviewee, so that I would have an understanding of how it felt to be interviewed, particularly when information was being disclosed that may cause discomfort. This practice interview was extremely useful as my supervisor is an experienced researcher who has conducted many interviews. I was therefore able to benefit from observing her interview technique and skills while appreciating the role of the interviewee. It also allowed me to identify the assumptions I was bringing to the study.

Most of the interviews took place in the participants' homes where they felt comfortable and that privacy was assured. One interview took place in the participants' office that was in a private area away from the clinical setting. Each interview took between 1-1½ hours to complete. Each interview was recorded with two tape recorders, one as a back up, in case the primary one failed. Initially the participants were conscious of the recorder, but very quickly forgot about them and the interviews flowed freely and easily. My main focus was to ensure that I did nothing to lead or change the direction of the interview so I concentrated on listening and exploring their stories by using open ended questions in order to gain a deeper understanding of the participants' experiences. Questions like, "Can you tell me more about that?" or, "Can you explain what you think about that?" were used in order encourage the participants to expand on their stories. I was aware that the use of body language on my behalf was important to encourage the participants to relax so I used facial expressions and nodding to encourage them to talk more freely.

Semi-structured questions were used because this allowed new questions to be brought up during the interview as a result of what the interviewee said, also allowing the interview to be more conversational. This conversational approach is important for the exploration and gathering of experimental narratives (van Manen, 1997, p.66). The specific areas that I wanted to explore were thought about well in advance of the interview, and an informal interview guide was used (Appendix E). Interview guides help the researcher to focus on the research topic by enabling the interviewer to tailor the question to the particular context of the interview without constraining them to a particular format, but ensuring consistency across the interviews (Lindlof & Taylor, 2002).

Each participant was able to recall their experiences of shoulder dystocia with absolute clarity, and they spoke freely. It was important however to ensure that the conversation remained focused on the topic, thus careful attendance was paid to what the participants said so that the appropriate follow-up questions could be asked. The participants also remained focused throughout and seldom moved away from the topic for review, so there was very little need to redirect the interview.

Some of the stories brought back memories of distressing events but none of the participants chose to discontinue the interview and no-one requested that any

information be left out. Most of the participants found the interview experience beneficial as it allowed them to reflect and 'debrief' about their experiences of shoulder dystocia. None of the participants indicated that they needed counselling or support following the interviews.

### *Transcription of the Interviews*

Although very time consuming, I personally transcribed all of the interviews. In doing this, I was able to recall each interview in much more depth, making the strength and richness of the data much more apparent (van Manen, 1990). With each transcription, I found I could identify emerging themes for exploration.

Once completed, the typed interviews were sent back to the participants to ensure that they were correct and reflected the true meaning of what they had said. One participant asked for one comment to be changed, otherwise the data was left unaltered. No one asked for any information to be withdrawn. On receipt of the participants' acknowledgement of correctness I began to analyse the data.

## Data Analysis

In qualitative studies, the researcher begins by talking with people who have first hand experiences with the phenomena under study. The semi–structured nature of the interview allowed the participants to express a full range of beliefs, feelings and behaviours. The narrative data provided by the participants was read over and over again as this familiarisation and searching for meaning encouraged insight and theories to develop.

Analysis and interpretation of the data were concurrent and ongoing throughout the course of the data collection and transcription. There were four cognitive processes involved in the analysis as described by Morse and Field (1995). Firstly, and early in the analytical process, it was important to make sense of the data and to understand 'what was going on'. This happened whilst the data was in the process of being collected. Morse and Field describe this as *comprehension*. Once comprehension was achieved, I was able to thoroughly describe the phenomena under study. The second stage involved synthesis of the data and inductively putting pieces together. This gave a sense of what was typical throughout the data, and at this point I was able to make some general statements about the phenomena. The data was then systematically sorted and

the narrative information began to 'cluster' into coherent categories (Polit & Beck, 2006). This systematic 'sorting' of the data is described as *theorising* (Morse & Field) and this process continued until the best and most consistent explanation was found. These explanations for practice in relation to shoulder dystocia were further sorted so that the data became increasingly focused and purposeful. As explanations of practice developed, I was able to interview further participants, who could confirm or challenge the explanations given by participants regarding their experience of shoulder dystocia. The sorting of these explanations resulted in the emerging of themes from the data. DeSantis and Ugarriza (2000) define a theme as "an abstract entity that brings meaning and identity to a current experience and its various manifestations. As such, a theme captures and unifies the nature or basis of the experience into a meaningful whole" (p.362). Once the themes were identified, they were used to build a descriptive and meaningful explication of the problems and practice of shoulder dystocia.

Graneheim and Lundman (2003) present a method for qualitative content analysis of qualitative descriptive data. This type of analysis identifies important concepts that are then divided into *meaning units*, which are descriptions close to the text. The meaning unit is then condensed to allow the researcher to interpret the underlying meaning of the text. The condensed meaning unit is abstracted into sub-themes that identify the threads of meaning through the text. Then, phenomena related to the sub-theme, can be developed into themes that link the underlying meaning together in categories. What follows is an example of how this was initially used in the data analysis.

| **Meaning unit** *Data that occurs often and interviews have in common* | **Condensed form** | **Code** *Essence of what has been said* | **Sub theme** *All the material on this matter* | **Theme** *Data collated into one theme* |
|---|---|---|---|---|
| I put my hand in posteriorly … I put it up as far as it would go – my wrist had disappeared – I grabbed and put my fingers under the baby's arm and luckily the midwife, who's very competent, knew what to do and I started to pull and she started to push and I was able to move the baby, twist it round by traction under the axilla. I think I had 2 fingers in (under the axilla) | Hand posteriorly – traction – fingers under axilla – able to move baby | Moved baby with hand posteriorly - fingers under axilla | Axillary traction moves babies | Axillary traction works and has some advantages over other manoeuvres |

In order to ensure depth of interpretation of the data and bring to light the true meaning of the participants' experiences, it became evident that more than descriptive theory was required; explanation and interpretation of the data was needed. Although non-categorical methods of research can be described as blurring the distinctions between qualitative approaches (Baker, Wuest & Stern, 1992), they provide coherent and meaningful accounts of the experiential knowledge and generate interpretive description capable of informing practice (Thorne, Reimer Kirkham, & O'Flynn-Magee, 2004). The research designs of interpretive description do 'borrow' from other hermeneutic approaches (Thorne, Reimer, Kirkham, & MacDonald-Emes, 1997); it is recognised that no single approach can encompass the multiple realities present in data. It became clear in the analysis of the research that a combined analytical approach was required to elicit the in-depth meaning of the participants' experience.

The hermeneutic 'hue' of this research facilitated more in depth exploration and analysis of the participants' experience of dealing with shoulder dystocia in which both the understanding and actions of the participants were revealed. This, in turn, meant that the knowledge that the participants had gained from their formal training, together with the knowledge they gained from professional experiences of shoulder dystocia, could be identified, described, and explored in depth. Hermeneutic analysis was the method of choice because this enabled in-depth interpretation of the participants' actions, which subsequently illuminated the underlying meaning and dimensionality of shoulder dystocia.

### *Hermeneutic Data Analysis*

The 'hermeneutic hue' brought to this study enabled thematic analysis that was both interactive and reflexive (van Manen, 1997). Thematic analysis undertaken in this way provides both informative (qualitative descriptive) and interpretive (hermeneutic hue) views to the problems and practices of shoulder dystocia (Sandelowski, 2000; van Manen). This process was facilitated by the process of writing and re-writing, as van Manen claims that a text is only workable when it lets the meaning show through. The writing and re-writing allowed the participants' understanding and experience to be revealed. This reflexive, interactive and interpretive process facilitated in-depth conversations with the participants' experiences. Further re-writing brought rich and even deeper understanding to even the most minor details of the participants' experiences. van Manen argues that writing and re-writing is the most important step in

hermeneutic analysis, as it generates understanding of the participants' experiences. It therefore became the central activity for the process of interpretation.

An example of writing and re-writing follows:

> *I put my hand down the baby's back and into the vagina posteriorly so I'm following the sacral curve and I locate the shoulder.* Kim

First write: Kim is able to put her hand into the posterior aspect of the vagina and, by using the space in the hollow of the sacrum, she is able to locate the fetal shoulder.

Second write: Kim is using the contour of the baby's back to guide her hand into the posterior aspect of the pelvis. In conjunction with this, she follows the curve of the sacrum in and, by using the space available in there, she is able to locate the fetal shoulder.

Finally: Kim is 'using' the fetus to guide her hand into the place that it needs to be. By entering the vagina and following the fetal neck, Kim describes how the posterior shoulder can easily be located in the pelvis. By using the space around the fetal neck, Kim was able to slip her hand in and onto the shoulder. In effect she is following the 'line' of the fetus by sliding her hand down the back of the fetal head, into the curve of the fetal neck, along the shoulder, over the shoulder and into the axilla from behind. The fetal anatomy had literally 'shown her the way'.

## Trustworthiness

Although qualitative and quantitative methods are fundamentally different, there is a tendency to evaluate both approaches against criteria such as *reliability* and *validity* that are suitable for quantitative research only (Brink, 1989; Robertson & Boyle, 1984). This approach ignores the epistemological differences between qualitative and quantitative studies as the criteria of validity and reliability are based on the positivist assumptions of the research tradition that created them (Ryan-Nicholls & Will, 2009). Many researchers therefore dispute the appropriateness of quantitative evaluation of

qualitative research (Emden, Hancock, Schubert & Darbyshire, 2001; Emden & Sandelowski, 1998; Koch & Harrington, 1998).

The aim of all research studies is to interpret or analyse meaning from the data, (Denzin & Lincoln, 1998) and as quantitative evaluation of qualitative research is not suitable, the framework suggested by Lincoln and Guba (1985) has been utilised to test rigour in this research project. Lincoln and Guba substituted reliability and validity with the parallel concept of *trustworthiness*. There are four aspects to this framework: *credibility*, *transferability*, *auditability* and *confirmability* (Lincoln & Guba).

### *Credibility*

The truth value of qualitative research - *credibility* - is subject-orientated rather than defined by the researcher (Sandelowski, 1986): the truth is found in the discovery of human experiences as they are lived and perceived by the participants (Sandelowski). The researcher is the main data-collection instrument, and the measure of credibility is assessed in terms of the researchers' reflections on the research process as well as the participants' ability to recognise their experience in the research report. The richness of the data allows the participants to recognise their own experiences in the accounts. Credibility was achieved by spending time with the participants and the interviews were conducted in a relaxed and conversational manner. Fostering the development of trust between myself and the participants established credibility. The participants were also aware that I had a deep understanding of the experiences they described and so the questions asked were all relevant to the phenomena under study, thus furthering exploration of the subject.

Peer-debriefing was used to ensure credibility of the study, following Lincoln and Guba (1985), who suggest that this exposes the researcher to searching questions. As a member of my professional community, my research supervisor provided regular peer-debriefing by asking questions that prompted me to look at, and think more deeply about, the phenomena under exploration. This ensured that the data analysis was in-depth but remained congruent with the participants' experience of shoulder dystocia.

In order to strengthen credibility, it was important to actively search for, and address, discrepant cases. One participant offered some conflicting viewpoints, which were included and addressed as this is an important strategy for improving the credibility of

qualitative inquiry (Lincoln & Guba, 1985). This allows the phenomena to be explored not only in-depth, but from a number of angles and perspectives.

### *Transferability*

The nature of naturalistic inquiry makes it very difficult to specify the extent to which the findings of one study can be generalised, or transferred to another study, at another time. It was important therefore to ensure that *transferability* was established by the production of rich, responsive and detailed description of the context in which the research was conducted, thus enabling other researchers to assess the usefulness of these findings within their own contexts (Lincoln & Guba, 1985).

It was also important that other health professionals could recognise the richness of their descriptions, and the depth of the analysis of their own experiences, and so make possible the transfer of these findings to their clinical practice. Initial informal discussions of the provisional findings of the study with other health professionals has illustrated this, with one obstetrician saying that he will now go back to his pre-HELPERR practice of delivering the posterior shoulder first, as a result of discussion with other health professionals and their successful experiences. Whilst this is not transferability in the general sense, the provisional findings of the study have already had an impact on clinical practice in that the knowledge that has been transferred is already being used in clinical practice with a great deal of success.

### *Dependability*

*Dependability* refers to the stability of qualitative data over time and conditions. It has been argued that there can be no credibility without dependability (Guba, 1981). Strategies used to ensure dependability therefore overlap with the strategies used to ensure credibility. The data and relevant supporting documents are made transparent in this research report, and an audit trail maintained, so that external reviewers can examine how conclusions are reached. The research question, analysis of the data and interpretation of the findings have been linked to ensure that a structured and linked pathway have been followed (Schneider, Elliot, LoBiondo-Wood, Beanland & Haber, 2003). The reasons for undertaking the study therefore have been explained, the research question identified, the reason for the choice of methodology identified, and data collection and analysis explained.

### *Confirmability*

*Confirmability* refers to the objectivity or neutrality of the data, which means that the accuracy, relevance and meaning of the data would be agreed by other independent persons (Polit & Beck, 2006). Confirmability is assured when the criteria credibility, transferability and dependability are achieved (Lincoln & Guba, 1985; Sandelowski, 1993). Furthermore, confirmability also includes reflection on the research process by the researcher (Lincoln & Guba).

Reflective journaling ensures that the researcher acknowledges the influences and impact that their own actions and decisions can have on the research project (Horsburgh, 2003). My personal reflections throughout this research process therefore have included journaling my thoughts and concerns; reflective writing about the research problem; what standards are appropriate; and also the many questions that I have needed to ask my supervisor. I could then use the journal to discuss key issues further with my supervisor during supervision interviews. Key thoughts would occur at any time, so I jotted them down and added them to the journal on my return home. I found that the journaling was spontaneous rather than regular, and was the method of journaling that suited me best. I found that reflective journaling helped me to crystallise ideas throughout the whole research project.

Awareness of this study in the clinical area has also promoted a great deal of informal discussion and even spontaneous teaching sessions. This has stimulated even more reflective thoughts and ideas. Debriefing with practitioners who have then successfully managed shoulder dystocia has contributed immensely to the reflective process even further.

## Conclusion

The data from this study was analysed using a qualitative descriptive design with a hermeneutic hue. This interpretive descriptive approach allowed a more comprehensive analysis of the participants' experiences to be sought.

The sampling of the participants was purposive, as it was important to select participants who had significant knowledge and experience in the management of shoulder dystocia. Throughout the study, the participants' confidentiality and

anonymity have been protected, and their right to protection from discomfort or harm upheld.

Data was collected using semi-structured interviews that were arranged in accordance with the participants' wishes. Following transcription of the interviews, the accuracy of the data was endorsed by the participants. Analysis was concurrent and ongoing during collection of the data, involving the four cognitive processes of *comprehension*, *synthesis*, *theorising* and *recontextualising* (Morse & Field, 1995). These processes were used to develop meaning units - descriptions close to the text - and subsequently themes emerged. In order to ensure depth and richness, the data was further analysed using the 'hermeneutic hue', allowing the interpretation and explanation of the participants' actions to illuminate the meaning and dimensionality of shoulder dystocia.

In order to ensure trustworthiness of the study, the frameworks of *credibility*, *transferability*, *audibility* and *confirmability* were adhered to (Lincoln & Guba, 1985). Credibility was achieved by spending time with the participants, peer debriefing and the search for discrepant cases. Rich and detailed descriptions have ensured transferability, whilst relevant supporting documents and maintenance of an audit trail have established dependability. Confirmability is assured when the frameworks of credibility, transferability and dependability are achieved (Lincoln & Guba; Sandelowski, 1993) and this has been enhanced by reflective journaling throughout the whole research project.

# CHAPTER FOUR

# Shoulder Dystocia and HELPERR

## Introduction

The first theme developed from the data relates to how participants in this study were originally taught to manage shoulder dystocia. Subsequently, they were introduced to the teachings of HELPERR. They describe how their thinking and practice changed following the teaching of HELPERR.

## Pre - HELPERR

The HELPERR mnemonic began to be taught as a strategy for management of shoulder dystocia in the mid- to late-1990's. Prior to HELPERR, the management of shoulder dystocia was acknowledged in text books and in medical and midwifery education sessions. A variety of strategies to resolve shoulder dystocia were suggested, but there was no definitive method or manoeuvre recommended as being the 'best' way to manage the problem. Thus the management of shoulder dystocia was primarily learned at the bedside, when new practitioners worked with more experienced practitioners who had seen the problem before. This learning appears to have involved a number of strategies, such as moving the woman either into left lateral position, or onto all fours. The management seems to have been something primarily 'learned on the job' rather than something taught in formal education sessions or with the use of acronyms.

Anna had been working as a midwife in a third-world situation where there was a great deal of poverty and malnutrition. She remembers many obstetric emergencies during that time but shoulder dystocia was not one of them. The problem therefore was completely in 'the back of her mind'. She had only been back in New Zealand for a short time when she was faced with a shoulder dystocia. Obstetric emergency training had only just begun in New Zealand at that time, and Anna had no 'formal' training on how to manage the problem, so she relied on the experience of others. She was working with an experienced practitioner when the shoulder dystocia occurred. Anna has vivid recollections of the events:

> *I was with a very experienced Charge Midwife…as the head was being born and it was that really slow, slow, slow, slow delivery of the head. And she just said "turn her on all fours" and that was it – we turned her on all fours and I thought 'oh'… and that baby's shoulders delivered with the next contraction. She said that she believed that in her experience that the majority of shoulder dystocia's were relieved by a change of position. She said that her preference had always been left lateral and then she had read something about turning people onto hands and knees. It really stuck in my mind.*

Anna's learning of how to manage shoulder dystocia came from working alongside an experienced Charge Midwife. She describes the process of recognising shoulder dystocia and then the management which came as instructions from the Charge Midwife. Management simply involved turning the woman on all fours and then almost to Anna's surprise the baby was born with the next contraction. The Charge Midwife knew from experience that a change in position would bring about delivery of the shoulders. The position in itself, either left lateral or hands and knees appeared not to be as important as the change in position. This became a very important part of managing shoulder dystocia for Anna and was the first strategy that she would use from then on when faced with shoulder dystocia.

Anecdotally, it is well known that many experienced and older midwives would change the woman's position as their first step in the management of shoulder dystocia. There is evidence to suggest that pelvic dimensions can be maximised by altering position. Simpkin (2003) suggests that the pelvic joints are mobile and that dimensions can change in accordance with the woman's position. When semi-reclined, external pressure exerted by the surface (bed/chair) bearing the weight might impair the posterior movement of the sacrum and coccyx, whereas lateral positioning would not. Sutton (2003) supports this view and describes the increasing internal pelvic dimensions as a result of the rhombus of Michealis - the sacrum and three lower vertebrae - moving backwards by up to 2cm. Although this evidence demonstrates the reasons why positional change may help, the participants in the study had recognised the benefits of positional change before they were aware of the theory behind the manoeuvre. They felt that simply changing position somehow dislodged the shoulders, thereby resolving the problem.

Sally had been working as a midwife for many years before the HELPERR management strategy for shoulder dystocia became common in practice. She had always used the left lateral position for managing the problem and reinforces the use of positional change:

> *The way we dealt with shoulder dystocia was to immediately turn the woman onto her side…this was where most of my success with shoulder dystocia was.*

Sally also presents a case for the first step in the management of shoulder dystocia being that of changing position. Sally claims that most of her success with shoulder dystocia has come from positional change and in particular from turning the woman into the left lateral position.

Anna and Sally learned from their own experiences, and from other practitioners', that the first step in successfully relieving shoulder dystocia was to change position. This was knowledge that predated HELLPER and that came from practice and experience of the reality of shoulder dystocia. It is important at this point to note that, for these practitioners, a change of position was the first step in managing the problem. In HELPERR, however, the last 'R' on the mnemonic is *the roll*, which means to place the woman into the all fours position. This manoeuvre - known as the Gaskin manoeuvre - has been reported as being successful in reducing shoulder dystocia in 83% of women (Bruner et al., 1999). It is not clear why this manoeuvre is so effective, but it may be simply the change in position that disimpacts the shoulders. Despite the effectiveness of this manoeuvre, the participants in the study had seen this used least often in clinical practice today, and especially since HELPERR mnemonic has been used.

## The Influence of HELPERR

The formation of the profession of obstetrics in the 17$^{th}$ century meant that birth primarily became a subject of science and not nature. This gave medical practitioners a significant degree of autonomy and privilege over the process, with this scientific ideological framework regarding childbirth as pathological rather than physiological. (Arney, 1982). This scientific approach is still the dominant paradigm today, and its influence on childbirth can be seen everywhere, including the management of shoulder dystocia. Medical knowledge has been used to develop a 'system' for dealing with the problem of shoulder dystocia. Thus the HELPERR system has been introduced into

obstetric emergency training. It is assumed that it is evidence-based, despite the lack of scientific evidence to support the use of many of the manoeuvres recommended.

The HELPERR mnemonic has been used in obstetric emergency 'skills and drills' training since around the mid 1990's. It encourages a systematic approach to managing the problem (Neill & Thornton, 2000; Simpson, 1999) yet there is no clear evidence of the best order to carry out the manoeuvres. Although the manoeuvres do not need to be employed in the order in which the mnemonic suggests, some of the literature encourages a 'stepwise' approach (Gottlieb & Galan, 2007), or recommends following algorithms so that practitioners can institute a sequence of manoeuvres (Camune & Brucker, 2007). As a result, practitioners have a tendency to 'work through' the mnemonic in the order in which HELPERR suggests, in the belief that this is best practice.

Kim had been taught to use the HELPERR mnemonic and had watched other practitioners use the strategy for management of shoulder dystocia. After witnessing failure of some of the manoeuvres on a number of occasions, she began to doubt the validity of the teaching. She describes the effect that the teaching of HELPERR has had in clinical practice:

> *With the HELPERR mnemonic it's like the DR C BRAVADO, in that they are useful to some extent, but what I think they do is encourage people to use the manoeuvres in the order in which the mnemonic runs, even though…you don't have to use it [HELPERR] in the order in which it comes. I've heard people in Delivery Suite say, "I expect to be able to walk into a shoulder dystocia situation and know exactly where they are up to", which to me is just ridiculous because you've got individual factors such as the woman's weight, size, shape, whether she's mobile, whether she's got an epidural in, all of which affects whatever you can do. So I think HELPERR encourages people to do things in that order.*

Whilst Kim recognises the usefulness of a strategy to aid recollection of a set of manoeuvres, she also sees that individual needs may be ignored. She recognises the individuality of each given situation and that it is not possible to perform some of the manoeuvres in certain circumstances, such as when there is maternal obesity or reduced

mobility. She also recognises that the manoeuvres do not need to be employed in a given order. Kim explains that what she found difficult to accept was the fact the all-fours manoeuvre (roll), which has been evaluated as one of the most effective, was the last to be mentioned on the mnemonic. Following HELPERR meant that, in clinical practice, she saw the all-fours manoeuvre being used last, even in situations where it was possible to do it first. This reinforces the fact that practitioners are following the order of the mnemonic. It seems that the use of the mnemonic has affected clinical practice in such a way that there is a tendency to adopt a 'one size fits all' approach, which can lead to individual circumstances and needs either not being recognised or being ignored in favour of following the mnemonic. It may be that the power of the mnemonic stops people from thinking and using their intuition about what may be the right thing to do.

Anna had returned to New Zealand some time before the HELPERR mnemonic was included in obstetric emergency training. On her return, she was taught by experienced midwives how to manage shoulder dystocia. When she learned the HELPERR way, she felt that she had now been taught the 'correct' way to deal with the problem, and thus embraced the teaching and adopted the manoeuvres in her practice.

> *It was about five years ago…being totally caught up in the programme. We got very influenced…which isn't necessarily a bad thing but it was like it almost became gospel…It almost became, "This is the way", and the last thing you would do is those moves. So the wisdom I'd learned from the Charge Midwife of change position was now the last thing you would do.*

Anna describes how the HELPERR management now became 'gospel'. The authority of the teaching had led her to believe that this was the only way that shoulder dystocia should be managed, and the only way that it was possible to resolve the problem. This happened despite knowing through practice-wisdom, and the teaching from other experienced practitioners, that positional change was an effective management strategy for shoulder dystocia. Anna's practice changed to follow the teachings of HELPERR and she began to follow this 'preferred' way of managing the problem. The very fact that the mnemonic is taught to practitioners implies that the actions and statements included in the programme are correct. Anna had learned that this new preferred way of practice was superior to the practice of old. She then followed the explicit and tacit

dimensions of the recommended behaviours (van Manen, 1999) in how she understood and acted in the management of shoulder dystocia. Her actions changed from knowing what had worked in the past to following the recommended mnemonic strategy.

Before HELPERR was introduced, Sue had been involved in a shoulder dystocia, and was trying to make sense of a situation where an experienced practitioner resorted to attempting to break the baby's clavicle in order to free the shoulders. She spent time thinking and talking about the situation and wanted to listen to how other practitioners managed the problem:

> *I often speak to specialists and other midwives about what they did with a shoulder dystocia and how they managed it. It's all very well reading about something but I like to listen to what people tell me…people's stories and peoples experiences.*

For Sue, the value of knowledge that comes from the lived experience of others is very important. Wise and experienced practitioners have knowledge that they are willing to share, and by remembering those stories, Sue has been able to inform her own practice. Since the widespread introduction and acceptance of the HELPERR management strategy, it seems that this practice-wisdom has been invalidated and is no longer used because of the 'authority' of HELPERR. The HELPERR management strategy is also validated in the medical literature as being the 'best way' to manage shoulder dystocia (RCOG, 2005), which further reinforces its authority.

Sue has subsequently learned the HELPERR management strategy, but highlights the problems that teaching a structured approach may have:

> *The one problem with teaching people one way of doing things or the 'correct' way of doing things is that people get so locked into 'you do this first, then you do this, then you do this…' that it actually doesn't leave any room for improvisation or lateral thinking, or thinking on your feet and reacting to something that's happening at the time – the big picture stuff.*

Sue felt that the HELPERR mnemonic 'locked' into practice what should be done, rather than what could be done even though that is not what she had heard worked in

practice. She felt that applying management strategies in accordance with individual needs was more valuable than using a structured approach, so "looked outside of the square" for the answer to the problem. She demonstrates the use of lateral thinking in her practice. Smythe (2003) describes this type of lateral thinking - or thinking on your feet and reacting to something that's happening at the time - as the "spirit of safe practice". Sue uses the knowledge gained from experience (the bringing together of every piece of knowledge), the watching (what may happen or what has not yet happened), the anticipation (things that need to be watched for), the mindfulness (recognising what has happened) and the responsive doing (turning mindfulness into action) (Smythe) to assess and identify the best way for her to manage the problem of shoulder dystocia.

Alan preferred the structured approach to managing shoulder dystocia, and liked to use the mnemonic because it gave him a way to remember the manoeuvres. It was therefore the best way for him to manage the problem:

> *My way of always doing it is to use the HELPERR mnemonic purely because it's a way to remember it. So I go through the HELPERR mnemonic but I always stress, "I don't care which way you do it". What this does is give you a framework to make sure you don't miss one [a manoeuvre] – so whatever mixture of those letters you come up with is equally valid.… It's having something in your head that says, "Right, this hasn't worked – do this".*

Alan acknowledges that he did not see a 'real' shoulder dystocia until after the teaching of HELPERR began, and was unfamiliar with any alternative management of the problem, so he relied on the manoeuvres he had been taught. He acknowledges that the manoeuvres do not need to be employed in the structured order in which the mnemonic suggests, finding that he was able to apply individual needs to differing situations by "picking it accordingly". This demonstrates Alan's ability to think laterally by analysing the situation and reacting to what is happening at the time, despite the urgency of the circumstances. This is often seen in experienced practitioners such as Alan, but there is a danger that less experienced practitioners who are faced with the same situation become so focused in following the framework that they do not - or are unable to - recognise the requirements of the individual situation.

Learning the HELPERR management strategy for shoulder dystocia implies that if the suggested manoeuvres are adopted then the practitioner will become 'competent' in managing the problem; the practitioner has met the prescribed standard of practice and therefore will practice safely (Smythe, 2003). Being safe, however, is not always transparent and what we think is safe may not be safe at all (Smythe). This would at times be true for the HELPERR management strategy, as the manoeuvres suggested are not guaranteed to resolve the problem or ensure the safety of the baby or mother.

Learning how to perform the manoeuvres described in HELPERR implies that there is a degree of expertise required, and that once the manoeuvres are learned, the practitioner will have the expertise to deal with the problem. This implies that there is reliable knowledge to make the correct decisions (Freidson, 1988), yet the evidence about some of the manoeuvres recommended in the HELPERR mnemonic is unreliable. It is concerning, therefore, that the teaching of the HELPERR mnemonic for management of shoulder dystocia has been so widely adopted and embraced as the 'right way' to resolve the problem.

## Performing the HELPERR Manoeuvres

In order to perform the manoeuvres described in the HELPERR mnemonic the practitioner must be able to move the woman into the prescribed position and access the area of the abdomen just above the symphysis pubis. This may be problematic if the woman is obese or mobility is reduced by the use of an epidural. HELPERR does not take this into account and the presumption is that the manoeuvres can be implemented in all cases. The participants in the study describe how they have found difficulty in performing some of the manoeuvres. Alan has experienced difficulty when dealing with obese women:

> *They're so big. It's not a true McRoberts because their thighs are so big. Or their abdomen. Or both!*

Alan describes how difficult it is to place women in McRoberts position when the women are obese. In order for McRoberts position to be effective, the maternal legs need to by hyperflexed so that the thighs are against the chest wall. He recognises that if the legs are not adequately flexed, the pelvis will not truly rotate into the position that

results in the straightening of the sacrum and the increase in the pelvic outlet dimensions that provide more room to free the shoulders.

Anna experienced similar problems when working with another midwife who was very small in stature and a shoulder dystocia occurred:

> *It was the first wake up call for me around HELPERR because I'd bought into it completely. I mean, this woman is 180kg and I can no more move her legs up to her nipples and do suprapubic pressure than fly to the moon! But it was almost like we had got drilled into "This is what you do for shoulder dystocia". I think there is some benefit in that everyone is on the same page, but the danger of it is that you stop thinking. With this little midwife almost disappearing under this woman's apron, that was a real wake up call – it was just not appropriate. Why we have ever gone down the road of this being appropriate for everyone, I'm not sure, but it has got to be so much like, "If you do this it will resolve all shoulder dystocias".*

Anna describes how she had relied on the HELPERR manoeuvres to resolve the problem she faced. She tried to place the woman into McRoberts position by abducting and flexing the legs so that the maternal thighs were on the abdomen. The woman was so obese, however, that when she pushed the woman's knees backwards she realised that although the woman's thighs were against the abdomen that the knees were still at a 90-degree angle to the abdomen. Anna instantly recognised that the required rotation of the pelvis - which results in the straightening of the sacrum and an increase in the pelvic outlet - would not have occurred because the knees were not adequately flexed. She was unable to do anything about this problem so decided to ask her colleague to help by using the next step on the mnemonic and apply suprapubic pressure. At this point Anna realised that her colleague - who is very small in stature and much smaller than the woman involved - simply did not have the size or strength to perform suprapubic pressure on this particular woman. She also realised that even if her colleague had been able to do so, it was impossible to access the area of the abdomen just above the symphysis pubis because the woman's abdomen was so large and pendulous that it 'hung' over the symphysis pubis preventing any access at all.

It was at the point that Anna realised that both manoeuvres failed because of the individual characteristics of the woman, rather than failure of the manoeuvres themselves. Anna felt that this particular shoulder dystocia would have been resolved by McRoberts position and suprapubic pressure if the manoeuvres had been able to be instituted. This caused her to begin to question the validity of HELPERR, as it had never been suggested during training sessions that it was not possible to perform some of the manoeuvres on some women. She began to look at the woman's individual characteristics and recognised that these needed to be considered when managing the problem.

Kim also recognises that the manoeuvres described in HELPERR are not appropriate for all women given their individual differences, and that the individual characteristics of each situation need to be considered when managing shoulder dystocia:

> *You've got individual factors such as the woman's weight, size, shape, whether she's mobile, whether she's got an epidural in, whether she's in lithotomy, which affects whatever you can do.*

Kim highlights not only the problem of obesity, but also the problem of reduced mobility, which may be related to either obesity or that the woman has an epidural in place and is unable to move. The practitioner would be prevented from moving the woman into the all fours position and would therefore have to rely on the other (rotational) manoeuvres to resolve the problem if McRoberts position and suprapubic pressure have failed, and unlike McRoberts position and suprapubic pressure, the rotational manoeuvres are least well evaluated as being effective. If the woman is in the lithotomy position and doesn't have an epidural in place, it may be possible to turn her into the all-fours position, but the end of the bed would have to be replaced to achieve this, which may take some time in a situation where time is of the essence.

Consideration of individual needs and characteristics allows the practitioner to formulate care without making inappropriate decisions. Practitioners need to think ahead and plan what may be appropriate given the individual circumstances. This is often seen with more experienced practitioners, but less experienced practitioners may rely more heavily on the HELPERR mnemonic strategy to help them to manage the problem of shoulder dystocia. This systematic approach relies on the practitioner

knowing and remembering the required the steps to take. Anna highlights the difficulties that some practitioners face:

> *One of the problems with HELPERR - and one of the problems with the manoeuvres, really - is that the manoeuvres are quite complicated in terms of having them in people's heads – Rubins II, Woods screw, and reverse Woods screw. If you go along on any given day and say to a midwife, "Describe that for me", they will go, "Errr…?" So, for me, it's not something that people have like that, [easily], like they often do for PPH or cord prolapse. It's almost like those manoeuvres complicate things for people and maybe they end up thinking, "What is the manoeuvre?"*

Anna felt that because practitioners were only exposed to shoulder dystocia rarely, they might have difficulty in remembering the manoeuvres. She highlights how the names of the manoeuvres may not be remembered, but her main concern is that because of the complexity of performing some of the manoeuvres, the practitioners may not remember how to do them, especially in a situation of emergency:

> *The complexities of the manoeuvres – Rubins II, Woods screw and then reverse Woods screw - and what that means and how do you implement that! So, if you are only doing it once a year and you're thinking, "OK. Do McRoberts, suprapubic and then Rubins… Oh, what's that?" It's almost like it's too complicated for the every day person - who's maybe only seen one or two shoulder dystocias a year - to have confidence to go in and do manoeuvres that are going to resolve the situation in as short a time as possible. You know, I see that sort of thing happening sometimes, and so I think the manoeuvres are at times maybe detrimental to the process of resolving shoulder dystocia.*

Anna had seen in clinical practice the confusion that had occurred when practitioners were trying to perform the manoeuvres. She highlights that the main reason for this is because of the lack of exposure to the problem for most practitioners. Not only do they not remember what to do at times, but they also lack in confidence about performing an action that they don't do on a regular basis. Anna had occasionally witnessed not what 'should' happen, but what 'does' happen when practitioners were unable either to recall the correct way to do the manoeuvres, or to have the confidence to do them correctly.

This is particularly true in an emergency situation, where there is an immense amount of pressure on the practitioner to resolve the problem as soon as possible.

The participants in this study have demonstrated the need for an individualised approach to care when managing shoulder dystocia. There can be no standard method because each situation presents its own unique set of factors. Both the individual influences of the woman and the practitioner need to be considered. Some practitioners may not be able to perform some of the manoeuvres described in HELPERR because of their size or stature. Equally, the stature of some women does not allow them to be placed into McRoberts position or the symphysis pubis to be accessed for suprapubic pressure. Reduced mobility causes problems with positional change. The practitioner therefore 'can only do what they can do'. Smythe (2003) describes this as a world of practice that is disordered, where the practitioner is trapped and can only do what is possible at the time. The ordered world of the HELPERR mnemonic may only serve to confuse matters in the practice situation and cause delay in resolution of the problem. There is very clearly a need therefore for a manoeuvre for shoulder dystocia which can be used in any situation by any practitioner, and is not reliant on McRoberts position or the mobility of the woman.

## Conclusion

In this analysis, it is evident that the learning that predated HELPERR came largely from practice, and the influence and teaching of other experienced practitioners. HELPERR influenced practice in such a way in that the manoeuvre of positional change that was most commonly used (left lateral or all-fours) is now the last manoeuvre to be attempted. The data implies that because HELPERR has been taught in obstetric emergency 'skills and drills' training, it became an accepted and valid way of dealing with shoulder dystocia.

The participants in the study have discussed how they have been unable to perform some of the manoeuvres described in HELPERR particularly in women who are obese or with reduced mobility. This is an important aspect of this research, as it demonstrates that McRoberts manoeuvre and suprapubic pressure - manoeuvres that have been objectively evaluated as being effective - are not appropriate for all women. The data highlights the need for a simple, effective manoeuvre which can be performed in any situation.

# CHAPTER FIVE

# Shoulder Dystocia and Axillary Traction

## Introduction

This chapter discusses how the participants in the study were able to gain access to the shoulders, and how easily they were able to manage shoulder dystocia by using traction on the fetal shoulder once access was gained. This is one of the most important insights they describe: how they have learned in the midst of their experiences to manage the problem of shoulder dystocia by using axillary traction, a manoeuvre that is not mentioned in the HELPERR management strategy.

## Gaining Access

Managing shoulder dystocia requires manoeuvres that are easy to perform so that the head to body delivery interval is reduced. Some of the participants in this study found that it was difficult to perform some of the rotational manoeuvres described in HELPERR. They found that access to the anterior shoulder, in particular, was difficult to achieve.

The HELPERR management strategy teaches that the internal rotational manoeuvres are performed by placing two fingers on the anterior shoulder (Rubins II), allowing the shoulder to be pushed towards the fetal chest into the oblique diameter of the pelvis. If that is unsuccessful, two fingers are placed on each shoulder (Woods screw or reverse Woods screw manoeuvres) in order to achieve the same. Anna found this particularly difficult to achieve and couldn't understand the rationale behind the manoeuvre:

> *You know – why do we actually think we should go in anteriorly when the baby's shoulder is jammed under the symphysis pubis? How are we going to get in?*

Anna highlights a problem that many clinicians face when trying to access the anterior shoulder to perform the internal rotational manoeuvres. The anterior shoulder is impacted behind the symphysis pubis, leaving no room to place a finger between the symphysis pubis and the shoulder so that the shoulder can be pushed into the oblique diameter of the pelvis. Whilst the theory of the manoeuvre is good - that once the

shoulders are rotated into the oblique and largest diameter of the pelvis, they will easily be born - the practicality of performing the manoeuvre is almost impossible.

Anna also highlighted the degree of trauma she had seen in a woman following shoulder dystocia, where persistent efforts were made to perform Rubins II manoeuvre and rotate the anterior shoulder:

> *The grazes and the swelling and the trauma. I had a young woman once – I'll never forget it – and the urethra had actually more or less detached and it was just hanging on by a thread…that I remember was from people trying to get in there…and the thumb kind of got against the clitoris or something. I can just visualise now the swelling there that you never see with a normal delivery.*

Anna recalls this experience with clear discomfort. She describes the level of trauma caused by repeated attempts at Rubins II manoeuvre. Once the fetal head is delivered, the skin of the labia is already stretched over the head. Continuing attempts to place a finger underneath the symphysis pubis can only serve to traumatise the labia even further, and, in this case, to such an extent that the urethra became displaced.

Alan also found that it was impossible to access the shoulder anteriorly. He felt if there was room to put fingers under the symphysis pubis then there shouldn't be a problem with delivering the shoulder at all:

> *If you can get your fingers under the symphysis then it's probably not a shoulder dystocia – you've got to go in posteriorly and then come anteriorly into the vagina to get your fingers onto the shoulder blade.*

Alan describes how he performs Rubins II manoeuvre and acknowledges that when there is a shoulder dystocia, it is impossible to slip a finger between the symphysis pubis and the anterior shoulder. In order to access the posterior aspect of the anterior shoulder, he describes how he puts his hand into the vagina posteriorly and then moves his hand along the fetal back and into the anterior part of the pelvis. The anterior shoulder fills the anterior aspect of the pelvis, which means movement of the hand between the fetal back and the symphysis pubis is still difficult. He also felt that

difficulty in performing the rotational manoeuvres could be attributed to the severity of the shoulder dystocia:

> *The rotation manoeuvres I actually find very difficult to do, but I think that is just a manifestation of the difficulty of the shoulder dystocia. If it's well and truly wedged, you are not going to be able to push it easily. If you can push it easily, you'd have got it with McRoberts and therefore I think it's a manifestation of the severity of the shoulder dystocia.*

He describes the difficulty he has in accessing and moving the anterior shoulder when there is a severe shoulder dystocia, because the greater the severity of the dystocia, the less space there is to place the fingers under the symphysis pubis. The rotational manoeuvres in HELPERR are recommended for just such cases - severe or bilateral shoulder dystocia - because McRoberts position and suprapubic pressure strategies will have already failed. It seems, however, that in the case of severe shoulder dystocia, the rotational manoeuvres are even less likely to resolve the problem.

Kim has witnessed other practitioners trying to perform the rotational manoeuvres and describes the difficulty they have experienced:

> *Every time I've seen anybody manage shoulder dystocia, I've never in my life seen them be able to get to the anterior shoulder to push the shoulder into the oblique.*

Kim had not only seen but also had attempted the rotational manoeuvres herself on a number of occasions, and found that access to the anterior shoulder was extremely difficult, if not impossible. She felt that the only part of the fetus that she had access to was whatever lay in the back of the pelvis. It would seem reasonable, therefore, that if there is enough space in the posterior aspect of the pelvis to access the fetus, then that space should be used to create movement of the shoulder.

The concept of being able to put a whole hand into the vagina once the fetal head is born seems almost impossible. The participants in the study had used axillary traction and found to their astonishment the ease with which they were able to enter the pelvis

and the amount of space available in the posterior aspect of the pelvis - the sacral hollow:

> *So you're going in and feeling the hollow, you just feel the hollow and that's where I know I've got space.* Anna

> *Of course, what I found was that because there was no shoulder down there, there was this huge gaping space… I was amazed at the space there was when I put my hand in… It was much easier than I had expected. I had my whole hand in – up to my wrist - which seems like 'huge'. Well, I could never imagine how you could possibly get your whole hand in, but there was a huge amount of space – I do not have tiny hands and it was remarkably easy. We hadn't even done an episiotomy.* Sue

> *I put my hand in posteriorly – I put it up as far as it would go – my wrist had disappeared…you have more room in the curve of the sacrum.* Sally

The study participants describe how the 'whole hand' was able to enter the vagina. The shoulders were very obviously not in the pelvic cavity, so the practitioners had to reach far into the pelvis to gain access. When there is no shoulder to be felt in the hollow of the sacrum, the shoulder must be impinged above the sacral promontory - a bilateral shoulder dystocia - and the only part of the fetus to occupy the pelvic cavity is the stretched neck (hence the turtle sign). In all of the cases the practitioners describe, it would seem that they were faced with this severe type of bilateral shoulder dystocia.

Kim describes how she finds the shoulder by entering the vagina by sliding her hand down to follow the fetal neck, down the fetal back into the posterior aspect of the pelvis and onto the shoulder:

> *I put my hand down the baby's back and into the vagina posteriorly so I'm following the sacral curve and I locate the shoulder.*

Here Kim is 'using' the fetus to guide her into the place that she needs to be. The two are almost working together to achieve a common goal, and Kim describes this as the "baby showing [her] the way". By entering the vagina and following the fetal neck,

Kim describes how the posterior shoulder can easily be located in the pelvis. In effect, she is following the 'line' of the fetus by sliding her hand down the back of the fetal head, into the curve of the fetal neck, along the shoulder, over the shoulder and into the axilla from behind. The fetal anatomy had literally 'shown her the way'.

Kim demonstrates use of her senses - in this instance touch - informed by her knowledge of the anatomy of the fetus, maternal pelvis and her understanding of shoulder dystocia to resolve the problem. Learning through experience, she has allowed the baby to show her the safe way. She simply follows what her sense of touch tells her what works, and what seems to be the right and most straight forward thing to do.

## Managing the Problem

The participants in the study describe how they have used axillary traction to resolve shoulder dystocia. They have already described how the 'line' of the baby is followed so that the shoulder can be grasped. Following the 'line' of the baby guides the practitioner's hand into the right place, and then the combination of the space available in the posterior aspect of the pelvis allows more room to move - search for the shoulder - and more room to manoeuvre - bring the shoulder down into the pelvic cavity and follow the sacral curve until delivery. There are differences however in how axillary traction should be used, depending upon whether the shoulder dystocia is unilateral or bilateral.

When a unilateral shoulder dystocia occurred, Kim describes how she used axillary traction when all of the manoeuvres described in HELPERR had failed. The woman was unable to be rolled onto all fours because she was in the lithotomy position following ventouse delivery of the head:

> *I put my whole hand in, and I got the posterior shoulder. I grasped the shoulder by putting one finger underneath the axilla, my thumb on top of the shoulder and using one finger to keep the arm down against the body so that I am putting pressure on the axilla and not on the humerus. The shoulders were in the A-P diameter of the pelvis and I just brought it through the curve of the sacrum and it was out, within about twenty seconds of taking over.*

Kim describes how she manages to secure her grasp on the shoulder by slipping her index finger underneath the axilla, placing her thumb on top of the shoulder and using her second finger to keep the fetal arm securely against the body so that the traction applied is directed through the axilla and not against the humerus.

**Figs. 1& 2** Anterior and posterior views demonstrating placement of the fingers in order to secure a grasp on the fetal shoulder. With the thumb on top of the shoulder, traction is applied with the index finger through the axilla, whilst the second finger secures the arm against the body.

Kim clearly describes the position of the shoulders in this case as being in the antero-posterior (A-P) diameter. The posterior shoulder had entered the pelvic cavity and the anterior shoulder was impacted behind the symphysis pubis. The level of descent of the posterior shoulder will vary according to the degree of dystocia but this is still described as a unilateral shoulder dystocia because the posterior shoulder had entered the pelvic cavity and was therefore below the pelvic brim. Kim was easily able to locate the posterior shoulder in the hollow of the sacrum, slip her finger into the axilla, and apply traction to follow that sacral curve until the shoulder delivered. She used the 'line' of the baby to guide her hand down the fetal back and into the axilla, and the space in the pelvic cavity to search for, and manoeuvre the shoulder.

Kim appears to have achieved this with minimal effort and describes the amount of traction used in this case as "moderate". She describes how she visualised the symphysis pubis as a "pivot" around which she was able to "swing" the anterior shoulder by using traction on the posterior shoulder to follow the curve of the sacrum until it was free. She then applied gentle lateral traction to the head to free the anterior

shoulder and the baby was born. The length of time it took her to achieve this was only about twenty seconds, which demonstrates the speed with which this manoeuvre can be effective.

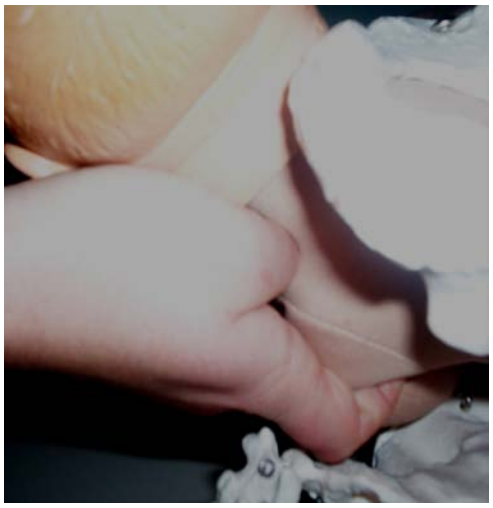

**Fig. 3** Demonstrates axillary traction by following the curve of the sacrum.

**Fig. 4** The anterior shoulder 'pivoting' around the symphysis pubis as traction is applied to the posterior shoulder.

The participants in the study found that there were variations in the degree of traction required to resolve shoulder dystocia by using axillary traction. In some cases they found that the shoulder dislodged much more easily than expected. Sue describes her experience:

> *I just gave a little pull on the axilla and the baby sort of tilted and out it came…It was a relatively gentle movement considering what was going on. It wasn't a really big sharp pull – it was just out. It was still a pull to get the baby out but it wasn't hugely difficult and there was constant progress from that point. It all happened so quickly and afterwards I sat back and thought, "Oh, that wasn't so hard!" It wasn't what I was expecting, so I was very, pleasantly surprised.*

Sue had been mentoring a new graduate midwife when a shoulder dystocia occurred. She took over, slipped her hand into the pelvic cavity, found the posterior shoulder and applied traction to the axilla. She was astonished at the ease with which she was able to move the shoulder. She describes the baby as having "tilted", which probably means that as she applied the traction, the baby 'angled' to follow the curve of the sacrum.

This indicates once more, that the symphysis pubis acted as a fulcrum or 'pivot' for the anterior shoulder. Once progress was being made, it did not stop, and she delivered the shoulder with relative ease.

Sue describes delivery of the posterior shoulder as "still a pull" but also a "relatively gentle movement" considering the circumstances. It appears that she probably had to use some effort to deliver the shoulder, but the implication here is that it is the effort used is on behalf of the practitioner. Although Sue was pulling, it was unlike the pulling on the fetal head that can deviate the head laterally away from the shoulder, stretching of the nerves of the brachial plexus. When the axilla is pulled, the traction is applied *through* the shoulder rather than *away* from the shoulder and as one part of the body is not being pulled *away* from another part of the body, less trauma occurs. When pulling on the head occurs, the force that is applied is directly on the fetus with the result that neonatal injury rates increase. When *effort* by the practitioner is used to *move* the baby, rather than *force* used to *pull* the baby, there seems to be much less risk of injury.

In other situations the participants in the study found that resolution of shoulder dystocia had been more difficult. The degree of difficulty is probably related to the bilateral nature of the shoulder dystocia, where neither of the shoulders have entered the pelvic cavity and the turtle sign occurs.

Kim describes two situations where bilateral shoulder dystocia occurred:

> *In one of them, the shoulders were in the transverse diameter, and when I got the right shoulder, I couldn't move it. I then realised that the shoulder wasn't in that sort of 'gap' where the curve of the sacrum is. So what I thought I needed to do was rotate the baby and so I applied traction, and at the same time rotated the shoulder towards the front of the baby's body, so that I didn't widen the shoulders. As I started to pull it down, it sort of rotated on its own really, so I just followed it. It came from what would have been three o'clock to one o'clock and came out of underneath the symphysis in the oblique diameter at one o'clock. The other shoulder was still inside and was really far back, but after the rotation, the remaining shoulder was now in the posterior part of the pelvis, so I just put my hand back in and used axillary traction over the sacral curve to*

*deliver that shoulder. That was a really big baby – 5.6kg. For a few days I couldn't pick anything up with the hand I'd used... I think I pulled a muscle!*

Kim describes an unusual situation where the shoulders were in the transverse diameter of the pelvis and had not entered the pelvic cavity in the normal way. This suggests a shoulder dystocia of significant magnitude. The fetal head had been in the occipito-posterior position, and once the head had delivered, the shoulders remained in the transverse diameter above the pelvic brim. The right shoulder of the baby was at approximately "three o'clock". Kim managed to slip her hand into the pelvis, and when there was no shoulder to be felt in "the gap" (or sacral hollow), she realised the extent of the problem and that both of the shoulders were above the pelvic brim. Although she had been exposed to a number of shoulder dystocias before and used axillary traction successfully, all of them had been unilateral shoulder dystocias of varying severity. This was the first time that she had been faced with such a problem and the anxiety she experienced at the time was evident. She recalls that she was thinking that neither axillary traction on the posterior shoulder nor using the symphysis pubis as a fulcrum for the anterior shoulder would work because the shoulders were not in the A-P diameter. She remembers the fear she felt at the time, but also that she was trying to work out what was the best thing to do. She located and grasped the right shoulder of the fetus from behind and applied traction whilst encouraging the shoulder to move towards the fetal chest in order to reduce the bisacromial diameter. As she did so, she felt the shoulder move and it simply rotated in an anticlockwise direction above the pelvic brim. What she did then was to "follow" the rotation and maintain the traction. Once the shoulder reached the oblique diameter of the pelvis, and was at about one o'clock, it slipped out from under the symphisis pubis and was born. The left shoulder at this point had entered the pelvic cavity but was still very high, so she slipped her hand back into the pelvic cavity and used axillary traction, as she would for shoulders in the A-P diameter, to deliver the remaining shoulder. The baby required resuscitation but was breathing spontaneously by one and a half minutes. There was no injury and he breast fed soon afterwards. This situation again demonstrates the effects of effort (move) versus force (pull). All of the effort was on behalf of the practitioner to such an extent that she suffered from a strain injury of the arm. The baby, however, had no undue force applied to him and thus did not suffer any injury at all.

**Fig. 5** The shoulders in the transverse diameter of the pelvis.

**Fig. 6** Rotation of the fetal shoulder towards the fetal chest into the oblique diameter of the pelvis.

**Fig. 7** The fetal shoulder freed from the pelvis in the oblique diameter.

Kim had obviously not been prepared for what happened in this situation, but she was able to "see" what she was doing, work it out in her mind and think "on the spot". The safe practitioner is always mindful of the uniqueness of any situation (Smythe, 2003) and Kim was able to respond in the most appropriate manner by taking heed of the individuality of the situation, and in that moment she was able to "go with what worked", even though it was physically hard to do.

The following week Kim was faced with a very similar situation:

> *The next one - the following week - that baby's shoulders were in the transverse diameter of the pelvis and I made sure that when I put my hand in I followed down the baby's back and I got the shoulder, which would have been on the left side of the pelvis – so the baby was looking directly up over – it must have been OP (occipito-posterior) and it's chin was jammed up against the symphysis pubis and so the shoulders were still in that diameter (transverse). So that time I thought "right – just follow the rotation". So as I applied the downward traction it naturally rotated forward and it came out on the oblique again at one o'clock. I think I learned from the other one. This one was 5.4kg!*

Kim clearly describes again how, when faced with a very similar situation, she followed the rotation and applied traction using the axilla. She followed what seemed to be working, and what had worked for her in the previous experience, and "trusted the process". The baby was born requiring resuscitation but recovered quickly and was uninjured. In both of these difficult shoulder dystocias, Kim used axillary traction to move the shoulder into the oblique diameter of the pelvis where it could be freed. In both situations, a significant amount of effort was required to deliver the shoulder. In the first case, Kim used so much effort that she suffered a strain injury, but the baby was remarkably unaffected despite the amount of effort she used. Had she applied force to the fetus - rather than effort on her part - the outcome may have been much less favourable. In the second case, both baby and practitioner were uninjured.

Anna found that even when there was a unilateral shoulder dystocia, some degree of rotation could be achieved by using axillary traction. In one case she attended, the fetal head was born and a shoulder dystocia evident. She describes the baby as "huge", and how the shoulders were in the A-P diameter of the pelvis when she tried axillary traction after the rotational manoeuvres had failed:

> *This was a huge baby and because it was really impacted it was quite difficult to actually move the shoulder to actually bring it into a different space. But it did move, whereas up to that point nothing else had moved.*

When asked what she meant by "bringing it into a different space", Anna explained that the shoulders were in the A-P diameter of the pelvis. The woman was already in McRoberts position so Anna slipped her hand in to the posterior aspect of the vagina

and entered the pelvic cavity. She located the posterior shoulder and applied axillary traction. As she applied the traction, she found that the baby's shoulder rotated to the oblique diameter and on application of traction, the shoulder literally birthed:

> *What must have happened is that when I did that, the anterior shoulder just rotated under the symphysis. In fact, they both came out together in the end, which is crazy. After all that, they escaped and came out together in the end.*

It seems that axillary traction can be used for both types of shoulder dystocia with what the practitioners in the study found to be excellent results. When unilateral shoulder dystocia occurs, the manoeuvre requires simple downward traction applied to the axilla of the posterior shoulder following the curve of the sacrum and using the symphysis pubis as a fulcrum around which the anterior shoulder is swung. Rotation of the shoulders into the oblique diameter can also be achieved, which in some cases may occur naturally, and in others, by effort on behalf of the practitioner.

The degree of traction required seems to vary depending upon the degree of the dystocia, indicated by the level of the descent of the posterior shoulder into the sacral hollow. Sometimes that traction may be moderate-to-severe, but it seems that by grasping the baby by the axilla - regardless of the degree of traction - it does not appear to cause neonatal injury.

In the case of bilateral shoulder dystocia, it may be that the advantage of using axillary traction is that the hand is slipped down the back of the head and onto the back of the shoulder, slipping the fingers under the fetal axilla from behind. Therefore, when rotation occurs or is encouraged, the fetal shoulder is being pushed towards the chest, reducing the bisacromial diameter. Once the shoulder reaches the oblique diameter, the traction causes the shoulder to slip under the symphysis pubis without causing damage to the fetus. The remaining shoulder may also require delivery by axillary traction as it can remain high in the pelvis.

The participants in the study found the manoeuvre simple to use, and once it was adopted, the head to body delivery time was relatively short. Despite the amount of effort used by the practitioner axillary traction did not appear to exert such force on the

fetus as to cause injury. Managing shoulder dystocia successfully therefore requires *effort* on the part of the practitioner rather than *force* exerted on the fetus.

## Learning in the Midst of Experience

The participants in this study were all taught to manage shoulder dystocia by using the HELPERR mnemonic strategy during the course of their 'skills and drills' training. None of them had been taught to manage shoulder dystocia by using axillary traction yet they learned through their own personal experiences and by watching and listening to the practice of others that this manoeuvre may be beneficial.

Anna discovered axillary traction when a woman was in the hands and knees position:

> *I went in posteriorly, because she was on her hands and knees. I thought I'd gone in anteriorly, but of course I had gone in posteriorly, and I'd got hold of the shoulder (under the axilla) and I just pulled the shoulder down and the baby fell out.*

Anna describes how she performed axillary traction when the woman was in the hands and knees position. The woman had chosen to birth in the hands and knees position and had not been moved there to resolve a shoulder dystocia; she was simply in that position when the dystocia occurred. Anna put her hand into what she thought was underneath the symphysis pubis. It had been her intention to perform Rubins II manoeuvre and to push the anterior shoulder towards the fetal chest. What happened was that her hand slipped into the sacral hollow which was now uppermost because of the woman's position. She recalls that she simply put her hand into the axilla, the shoulder moved and the baby "just fell out".

Her obvious surprise at the ease with which the baby was delivered following her action was evident. Prior to this experience, she had not used axillary traction and her intention had been to follow the manoeuvres described in the HELPERR mnemonic. When her hand slipped into the pelvic cavity the axilla seemed to be the easiest thing to grasp, and on doing so, she pulled down and the baby was born with ease. She learned by accident how simple this manoeuvre was to perform.

Following this, Anna witnessed other practitioners accidentally deliver the posterior shoulder when their intention had been to deliver the posterior arm:

> *So it's like we tried everything and got the posterior shoulder. I don't think they meant to get the posterior shoulder. I think they were trying to deliver the posterior arm but in fact moved it, and then it delivered, [the shoulder].*

Anna describes the delivery of the shoulder rather than the arm "by accident rather than by conscious design". She recognised that it had not been the intention of the practitioner to deliver the shoulder, but saw that when that accidentally happened, the baby was born. She began to realise that delivery of shoulder resolved the problem, and thus that bringing the arm out was not necessary. She also began to wonder as to what the benefits were of removing the posterior arm as opposed to simply applying traction to the axilla.

Anna also witnessed the practice of Kim, who was using axillary traction as a first line management strategy for shoulder dystocia despite the teaching of HELPERR. She recalls the events where a senior practitioner had been trying to resolve a shoulder dystocia using the HELPERR manoeuvres. In that situation all of the manoeuvres had failed; the woman was unable to be placed on her hands and knees because her legs were in the lithotomy position and the end of the bed had been removed. Kim took over following the failure of the HELPERR manoeuvres and used axillary traction to deliver the baby. The baby was born within 20 to 30 seconds of Kim taking over:

> *I just saw the result of it… I just saw what happened… And it was like, "Oh my God!" We really need to start having that conversation.*

The conversation Anna refers to is about management of shoulder dystocia. She realised that she had seen a manoeuvre work that she had not been taught to do in the obstetric emergency workshops, and began to wonder why this should be. She felt that there needed to be more discussion and investigation of the possible use of axillary traction as a first line management strategy, and thus began to wonder why HELPERR seemed to be the 'gospel' for management of the problem.

By accidentally doing, watching and thinking about the situations in which she had been involved, Anna's reflection on practice led her to believe that there may possibly be a way of resolving shoulder dystocia that was better than some of the manoeuvres described in HELPERR.

Kim had a similar experience. She had learned to use axillary traction after she witnessed a shoulder dystocia that was resolved by the practitioner attempting to remove the posterior arm. The baby was born in dreadful condition and suffered a fractured humerus as a result of the practitioner having grasped the baby by the upper arm in an attempt to move the arm across the chest. Kim recalls the events of what she describes as her "first real shoulder dystocia":

> *She went in and then said, "I've got hold of the arm…" But you heard this terrible noise – a crack – and she stopped. But I said, "Don't stop!" So she delivered what would have been the posterior shoulder and the arm came out at the same time. The arm was broken…*

Kim noticed that the shoulder was born before the arm was released, at which point she started to think about grasping the baby by the axilla rather than the arm. She felt that it would be much safer - and that the practitioner would be able to apply more traction with less damage - if they applied the traction to the axilla rather than the humerus. Kim knew that the practitioner in this case had not intended to apply traction to the humerus, but that on finding the arm - as she had been taught to do so in HELPERR - she tried to move it across the chest but accidentally applied traction to the humerus, with the resulting fracture.

Prior to this, most of Kim's learning around shoulder dystocia had involved the HELPERR mnemonic. Kim describes the shoulder dystocia as the "worst she had ever seen" and began to fear another shoulder dystocia of the same severity because she had seen how the manoeuvres described in the HELPERR mnemonic had not resolved the problem. After witnessing the delivery of the shoulder just before the delivery of the arm, Kim began to think more about the use of axillary traction as a possible successful manoeuvre. She felt that the rate of shoulder dystocia appeared to be increasing, and once she recovered from the fear and trauma that she had experienced, she felt as though she had to "get on and learn how to mange it".

> *What that taught me was that there was merit in it [getting hold of the axilla as opposed to the arm] because the only thing that moved that baby was getting hold of the posterior arm. But when I read through the research about delivery of the posterior arm, [I saw] there are risks of fracturing the humerus, which is exactly what happened to this baby – she had a fractured humerus. I thought then that there's got to be a better way of doing that so that you don't break the baby's arm. What I'd seen was using the space in the back of the pelvis and downward traction on the arm, and I thought, "Well, if you do that with the axilla that might work better." So that was what I moved on to - that's what I started to do.*

Following this experience, Kim began to use axillary traction as a first line management strategy for shoulder dystocia:

> *What I do is axillary traction. I don't attempt to deliver the posterior arm; all I do is keep the arm down and use the axilla as my point of traction. That way, I think you are less likely to break the baby's arm.*

Kim describes how she keeps the baby's arm down. She slips one finger into the axilla, places her thumb on top of the shoulder and uses one or one or two fingers on the top of the arm near the shoulder to keep the arm down against the fetal body. She grasps firmly and applies traction to follow the sacral curve. By doing this, she achieves traction that is directed through the axilla rather than through the upper part of the humerus. She always uses McRoberts position, and sometimes suprapubic pressure, in conjunction with axillary traction, with a good deal of success.

Kim learned from her traumatic experience what might be the best thing to do. She reflected on what happened and was thus able to analyse it and implement a new learning. Kim continues to repeat this new learning in the praxis of shoulder dystocia.

The participants in the study recognised that their learning was by discovery through experience. They analysed what worked and demonstrated the effectiveness and efficiency of axillary traction. During their journeys, they made sense of their experiences and moved from the knowing *what* to knowing *how* of axillary traction.

## Conclusion

The participants in the study have learned from their experiences how difficult it is to gain access to the anterior shoulder in order to perform the rotational manoeuvres described in HELPERR. They discuss the ease with which they were able to access the posterior shoulder by putting a whole hand into the pelvis. They were able to do this regardless of whether the shoulder dystocia was unilateral or bilateral, and they describe how they can use the axilla as a point for traction and rotation if necessary, resulting in the delivery of the shoulder with relative ease. The study participants describe how they accidentally discovered how to perform axillary traction during their experiences of shoulder dystocia. Once discovered, they realised that the manoeuvre was easy to perform - and could be effective - regardless of the degree of shoulder dystocia.

I regard this insight of axillary traction as the most important aspect of the research. This is a manoeuvre that the participants in the study have discovered by using their experiences, intuition and judgement. It is a simple manoeuvre that can be used to resolve shoulder dystocia quickly, and with relative ease.

# CHAPTER SIX

# Neonatal Outcomes and Shoulder Dystocia

## Introduction

This chapter relates to the outcomes and effects of shoulder dystocia. The participants in the study discuss the most common causes of neonatal damage observed when other practitioners have tried to resolve shoulder dystocia. They also discuss their experiences of the neonatal outcomes following different management strategies for shoulder dystocia. The outcomes relate to the physical damage the baby may suffer as a result of the manoeuvres used, together with the degree of resuscitation required following hypoxial insult.

## Pulling

The practitioners in this study had all witnessed fetal damage following shoulder dystocia and when asked what they thought damaged the babies most, they identified pulling on the head as being the most common factor:

> *I can remember the Registrar in this case just really pulling on the baby's head. He continued to do this [pull] and eventually he stopped... The baby had an Erb's palsy right from the beginning – you could see it. It was really clear in the neonatal examination.* Anna

When recounting this experience, it was clear that Anna had been very uncomfortable with the situation and that there was a real sense of the length of time in which the Registrar had continued to pull on the baby's head. Anna had seen that when the original pull failed to deliver the shoulder, the response of the Registrar was to pull even harder to overcome the obstruction, instead of stopping and trying another manoeuvre. There is a sense that the continued and excessive pulling on the fetal head caused the Erb's palsy.

Sue had also experienced similar events:

> *He was pulling [on the head] with his entire might.*

In this case, Sue had been working with a senior clinician for whom she had the greatest respect. Sue's description of the event clearly identifies the extent and continuance of the force that was applied when pulling on the baby's head. Again the clinician fell into the trap of trying to overcome the problem by simply exerting more force. Excessive force on behalf of the clinician is almost a 'reflex response' in trying to overcome the obstruction. When clinicians find themselves in this situation they are often unable to think clearly, so it could be said that they are acting on a reflex response rather than a thinking response. The baby eventually delivered and required resuscitation, but the excessive force used to deliver the shoulders had also resulted in an Erb - Duchenne palsy.

In another situation, Sue was working with another senior clinician when a shoulder dystocia occurred:

> *That turtle head [where the fetal head recedes and impacts against the symphysis pubis] there and then she couldn't get the shoulder out and she ended up pulling and pulling and pulling and the baby came out and it had quite a nasty palsy.*

The woman had previously had a shoulder dystocia, so Sue had asked the clinician to attend the birth of what she suspected was a larger baby. The senior clinician had turned the woman over into the hands and knees position because she felt that this position allowed her better access to pull on the baby's head. Sue describes again the "pulling and pulling" that occurred whilst attempting to deliver the shoulders. In this case, the clinician was attempting to deliver the posterior shoulder by pulling alone. The force of the pulling increased as time went on. The baby eventually delivered and suffered an Erb - Duchenne palsy that lasted for a number of weeks.

Sue's description of events again demonstrates that the overwhelming response to free something that is stuck is to give it a harder pull - the reflex response. In shoulder dystocia, however, pulling harder only serves to cause more damage to the baby. I would argue that the appropriate response in shoulder dystocia is always to stop pulling and think through what needs to be done to alleviate the problem- the thinking response - and *move* rather than *pull* the shoulders. The aim is to move the shoulders into a

position where they can birth, but continued pulling does not achieve the movement required and only causes injury.

Alan describes a situation where there was clearly a shoulder dystocia that was not recognised or the practitioner panicked and persisted in pulling on the fetal head in an attempt to release the shoulder.

> *People think, "Ahh, it's not a shoulder dystocia" and give a big heave and don't recognise it. And you end up with extension of the superior cervical roots. And they don't go for the manoeuvres soon enough – they think they'll get it with just a bit of a pull.*

He continues:

> *The other thing is once you get a shoulder dystocia and the adrenalin starts to run… you're like a man possessed, aren't you?… So you think you can do anything, and what you think is minimal effort when you can't actually get that baby out could be a hell of a pull.*

Alan describes what appears initially to be a simple procedure turning into a much more complex situation that is not resolving easily. The adrenalin surge causes the 'fight and flight' response, with the immediate reaction to pull harder. Alan's actions are again dictated by his reflex response, which leads to him to continue to pull. He also describes how it is easy to misinterpret the amount of force used when pulling because of the urgency of the situation.

It is common practice for the clinician to apply lateral traction to the fetal head to release the anterior shoulder from under the symphisis pubis during the normal birth process. Clinicians refer to this as 'downward traction' but in fact this manoeuvre deviates the fetal head to the side, resulting in lateral traction (from ear to shoulder). This action causes the brachial plexus to stretch, with injury more common when the traction is applied rapidly, rather than slowly (Allen, 2007). Traction to the fetal head during shoulder dystocia should not be greater than traction used during normal birth but in practice, it commonly is (Poggi et al., 2004), as highlighted by Alan. Anna's description of continuing to pull and Sue's description of the force used when pulling

on the head demonstrates that pulling longer and harder is a natural response when attempting to extract something that is unexpectedly stuck, but it is an inappropriate response to shoulder dystocia. The greater the difficulty in delivering the shoulders, the more the traction is applied in some cases, therefore increasing the risk of fetal injury.

Anna and Kim also noticed that when excessive pulling on the baby's head occurred then the need for resuscitation was greater:

> *People think that they are going to deliver this baby just by pulling on its head [but] what happens is that the babies are very flat and take a lot of resuscitating.* Anna

Again Anna describes the reflex response of a clinician trying to overcome the obstruction by pulling harder on the fetal head. It may be that continued pulling not only causes physical injury but also - as time passes and continual pulling fails to deliver the shoulders – subjects the fetus to subject hypoxial insult (as the head to body delivery interval increases it can result in possible cord compression with a resulting significant drop in the blood pH level (Wood et al.,1973)). The longer the fetus is subject to hypoxic stress, the more likely he is to be born during the period of terminal apnoea, resulting in death without – or sometimes in spite of – resuscitation (New Zealand Resuscitation Council, 2006). Therefore by continuing to pull on the head, time is simply being wasted by attempting to do something that is not achievable.

> *He was pulling on the head – he just pulled and pulled and pulled on the head.* Kim

Kim describes her feelings of fear and helplessness as the pulling continued during a shoulder dystocia. It was clear to the observers that the reflex response of the clinician was to pull harder. But no matter how hard and long the pulling continued it was obvious that this was never going to alleviate the problem. Again, the clinician appeared to be acting on reflex rather than thinking through what needed to be done, thus the pulling continued. In reality, all that was happening was that time was being wasted. The baby was eventually born after the posterior arm was delivered. She suffered a fractured humerus, was profoundly shocked and hypoxic, in the terminal

apnoea stage. Following resuscitation she required ventilator support, suffered from seizures and spent a significant time in the Special Care Baby Unit.

All of the practitioners in this study found that continued pulling on the fetal head only serves to cause more problems. The practitioners witnessed continued pulling lead to brachial plexus injury, fetal hypoxia, a greater need for resuscitation and subsequent long term morbidity for the infant.

At this point it is interesting to note that if birth is allowed to progress without assistance, the posterior shoulder is born first. Sutton and Scott (1996) describe the birthing of the shoulders when a woman is in the upright position:

> *When the woman is in a position to 'thrust her pelvis', the baby uses the symphysis as a fulcrum to swing his head forward so that the posterior shoulder escapes over the perineum.* (p34)

In practice, clinicians have been taught to deliver the anterior shoulder first by the use of downward (lateral) traction, which contradicts the normal physiological process of birth of the posterior shoulder first. In effect, the clinician 'pulls' the fetal head downward to release the anterior shoulder. When clinicians pull to excess during shoulder dystocia, they are simply applying more force to an already accepted manoeuvre. If the physiological process of normal birth was allowed to happen and downward traction was not part of the birth, then the downward traction applied during shoulder dystocia may be viewed as abnormal. Clinicians therefore would be much less likely to resort to using downward traction - particularly to excess - significantly reducing injury to the baby.

The HELPERR mnemonic teaches that once the woman has been placed in McRoberts position, suprapubic pressure and *gentle* lateral traction should be attempted. Once the clinician is experiencing difficulty with the shoulders it can be very difficult for them to remain calm, especially given the urgency of the situation. The tendency therefore is not to apply gentle traction but to apply excessive traction and increase the amount of force applied to that traction as the situation worsens. This reflex response to pull harder makes the 'gentle lateral traction' advocated in HELPERR problematic as it may cause more damage by encouraging clinicians to pull inappropriately on the fetal head.

Therefore, perhaps once shoulder dystocia is recognised, lateral traction of the fetal head should *never* be attempted. This would teach clinicians to only use manoeuvres that carry less risk of injury to the fetus.

When shoulder dystocia occurs and the shoulders do not deliver with the first attempt at lateral traction, it would seem sensible not to attempt it again and definitely not pull harder. Perhaps the answer lies in the way in which we 'conduct' normal birth. Perhaps we should allow the normal physiological process to occur whereby the woman pushes the shoulders out herself instead of our common practice of 'delivering' the anterior shoulder first. This would give clinicians a greater understanding of the normal mechanism of the birth of the shoulders and discourage them from pulling on the fetal head at all. Therefore, when shoulder dystocia occurs it may be that the 'reflex response' would be to 'move' the shoulders rather than to 'pull' on the fetal head. Then perhaps the manoeuvre of 'gentle lateral traction' as described in the HELPERR mnemonic could be removed as it appears only to encourage the reflex response of the clinician to '*pull harder'*. This pulling harder which appears to cause the most injury to the baby could be increasingly eliminated and replaced by the moving of the shoulder. For shoulder dystocia, the mantra therefore could become *move* not *pull.* A 're-programming' of the reflex response may then occur, which would lead the practitioner to move rather than pull, resulting in less damage to the baby from ineffective and unproductive pulling.

## Neonatal Outcome

The participants in this study had witnessed a range of neonatal outcomes following severe shoulder dystocia such as babies born in the terminal apnoea stage or with neurological injury such as brachial plexus damage. A number of the participants linked these outcomes to management using the HELPERR mnemonic. Other participants spoke of axillary traction used with a good deal of success and were generally impressed with the result of the manoeuvre and the subsequent neonatal outcomes.

Anna had seen other practitioners use axillary traction on two occasions during shoulder dystocia. The practitioner attending the birth was unable to resolve the problem using the rotational manoeuvres. She recalls that the fetal heart rate had been normal before, and up to, delivery of the fetal head. She clearly describes the events as the birth of the

head being very slow, and that as soon as the head was born, the turtle sign occurred. She had witnessed a number of shoulder dystocias prior to this and watched other clinicians either pull excessively on the fetal head or attempt the manoeuvres described in the HELPERR mnemonic with no effect. The woman was already in McRoberts position, and as she had witnessed the success of axillary traction, she decided to use that manoeuvre only. At no time did she attempt downward (lateral) traction on the head. She slipped her hand into the posterior aspect of the vagina, located the posterior shoulder and slipped her fingers underneath the axilla. She describes the shoulders as being as being in the A-P diameter of the pelvis and, once she applied traction, the posterior shoulder literally rotated slightly and birthed:

> *I think its APGAR's were maybe 3 and then 10. It was fine… The recovery was really quick.*

Following the birth, the baby required resuscitation by intermittent positive pressure ventilation (IPPV). The baby began to cry after one minute and no gasping respirations occurred, which indicates that the baby had been born in a stage of primary rather than terminal apnoea. No brachial plexus damage occurred and Anna felt that this was because the head hadn't been pulled on.

In this case, Anna did not resort to the 'reflex response' of pulling on the head as she had seen before that pulling had little or no effect, and only served to damage the baby. She decided in the moment to use axillary traction because she had seen it used successfully before with minimal effect on the baby. Anna demonstrated a clear thinking response and was able to work out in her own mind what was the right thing to do. Even though she was faced with a severe shoulder dystocia, her thinking response allowed her to remain calm and use a manoeuvre that she had seen work very successfully before. In this case, axillary traction worked very well and alleviated the shoulder dystocia with minimal effect on the baby.

Removal of the posterior arm is taught in the HELPERR management of shoulder dystocia. In this manoeuvre the posterior arm is located, the elbow flexed and the forearm delivered across the chest in a sweeping motion. It is associated with a high incidence of humeral fracture (Gherman et al., 1998b), which had been the experience of three of the participants in the study. Alan had used delivery of the posterior arm

successfully, but also acknowledged that there were risks in performing such a manoeuvre. The participants describe their experiences with humeral fracture:

> *She'd gone in posteriorly, grabbed the hand and pulled the hand down in order to deliver the posterior arm, and in the process the baby's humerus fractured, which was the least of the baby's worries because the baby was born in dreadful condition.* Sue

> *She said "I've got a hold of its arm" and she just pulled. But you heard this terrible noise – a crack. The arm was broken. The baby was really shocked.* Kim

> *I knew I'd broken its arm because I felt the arm break.* Sally

Sally describes how she felt "sick" when she felt the arm break, feeling that she needed to stop what she was doing immediately because the fracture was mobile underneath her fingers. Her colleague encouraged her to keep going because, if she had stopped, the baby would have had no chance of survival as it was already in extremely poor condition. The baby was eventually born and resuscitated, but seizures began the next day. The fracture healed without complication.

In order to access the fetal arm, the clinician is required to put their hand in to the pelvic cavity even further, as the shoulder would be reached before the arm. It would be easier therefore to grasp the fetus by the axilla, as this is reached first and provides a point of traction, rather than relying on delivery of the arm to reduce the bisacromial diameter and hopefully cause rotation of the fetus. If this did not occur, the clinician would then have to pull on the fetal arm, which may already be fractured, in order to attempt to pull the shoulders through the pelvis. The pain and shock that occurs following bone fracture would then be increased by traction and cause further problems in the already hypoxic infant.

Sue was present at a shoulder dystocia when she intended to remove the posterior arm to resolve the problem.

> *I put my hand in posteriorly and what I was doing was looking for the posterior arm… And just the way it happened is that my two fingers went under the baby's axilla. I don't know why it happened or how it happened, it just seemed to happen naturally that way.*

The reason that Sue was looking for the posterior arm is because "that is what she had had been taught to do". When she put her hand into the vagina, her fingers inadvertently slipped underneath the baby's axilla. She had not intended to use axillary traction; rather she had intended to "sweep" the posterior arm across the chest and then remove the arm, just as she had been taught during obstetric skills training. A second midwife gave suprapubic pressure while Sue gave a pull on the axilla. Sue describes the events and the condition of the baby at birth:

> *I just gave a pull on the axilla and the baby sort of tilted and out it came. It was still a pull and it was definitely a shoulder dystocia but it was no great drama. The baby came out and I think her APGAR's were 4 or 5 initially – she needed a bit of bagging for a couple of minutes but she was fine. I got the paediatrician to check - I was worried I'd maybe injured her shoulder by putting my fingers underneath her arm - but her shoulders were absolutely fine.*

In this situation, Sue had not followed what she had been trained to do; instead, she had followed her own instincts, and 'it just happened'. Once her fingers slipped under that axilla she realised that this may be a "safe" place to grasp the baby. After all, when adults pick young children up, the safe way is to pick them up is by using their underarms and not the humerus because of the risk of fracture. Sue's embodied response in this case, when she accidentally found the axilla, was to use it to apply the traction, instinctively staying away from the arm. Perhaps it was her knowledge of anatomy and experience of having dealt with young children that lead her to do what she did, despite the fact that it contradicted what she had been taught to do. This in fact is a sensate response followed by sound thinking. Sue simply knew that this was the 'right thing' to do. It may be that mnemonics take away the knowledge and intuition that comes through the senses in a situation like shoulder dystocia by teaching us a defined set of actions that are perceived to be right.

Sue then describes the ease with which she was able to move the baby using axillary traction:

> *I'd always imagined how on earth you would get your hand in to try to find anything and get to the shoulder or the arm or the hand. How on earth? It must be so tight in there. Of course what I found was that because there was no shoulder down there, there was this huge gaping space, so actually it was much easier that I expected. It was still a pull to get the baby out, but she came out.*

What Sue describes is a bilateral shoulder dystocia. The posterior shoulder had obviously not entered the pelvis and remained above the pelvic brim. This is the worst type of shoulder dystocia and usually has the poorest outcomes, as described in the literature review. Despite this, Sue found it incredibly easy to enter the vagina and put her hand in far enough to reach the posterior shoulder. She was then able to bring the shoulder down with what she describes as "a bit of a pull", which implies that some effort was needed to move the shoulder. But the baby tilted, which probably indicates the entry of the posterior shoulder into the pelvic cavity, and then moved relatively easily. The shoulders were born with what Sue describes as "no great drama!"

Sue seems to have been following her senses and thinking through her response to what she was feeling. She sensed that the rotational manoeuvres described in HELPERR were not appropriate in this case as she recognised the severity of the dystocia. She knew that pulling on the head and the Woods screw manoeuvres would not work, so she decided to go straight to the removal of the posterior arm manoeuvre. Instead, when she found the axilla and her fingers slipped underneath and she realised that she had a point at which she could apply traction. It took some effort, but applying traction to the axilla moved the baby down, and she was able to deliver the shoulder with relative ease.

The baby recovered quickly, which implies that - as in Anna's experience - the baby was born in the primary, rather than secondary, apnoea stage. No Erb - Duchenne palsy occurred and there was no obvious damage as a result of using traction underneath the baby's axilla. HELPERR suggests that each manoeuvre is performed for at least 30 seconds before moving onto the next one (ALSO, 2000). The greater the severity of the shoulder dystocia, the greater the number of manoeuvres required to deliver the baby and, the longer it takes, the greater the hypoxial insult. Using axillary traction,

however, Sue resolved the problem rapidly and effectively with a very good neonatal outcome.

Anna discusses her experience of numerous manoeuvres used in a fetus that had a normal cardiotocograph (CTG), clear liquor and no evidence of fetal compromise before the shoulder dystocia occurred:

> *I don't know what manoeuvres he did and it was like four or five minutes and the baby wasn't being born. In the end the baby survived but 'fitted'.*

It would be reasonable to assume that if the fetus is uncompromised before the shoulder dystocia occurs, then the more time the practitioner has to resolve the problem before permanent damage occurs. But even when the head to body delivery interval is less than 5 minutes, there is still significant risk of perinatal death (Hope et al., 1998; Stallings et al., 2001). If the fetus is already compromised, permanent damage - or even death - can occur within a short time of the shoulder dystocia. Kim describes her experience of death following a shoulder dystocia:

> *A baby I was involved with was dead at birth. That baby was a ventouse delivery but had a compromised CTG beforehand. He pulled the head out and only spent about 3 minutes trying to get the shoulders out before I did that one manoeuvre (axillary traction) and got the baby out almost straight away, but she couldn't be resuscitated. I think that's because she was severely hypoxic before we even started.*

Kim describes a situation where the fetal heart rate pattern was abnormal during the second stage, so a ventouse delivery was performed and a shoulder dystocia occurred. The HELPERR manoeuvres failed to deliver the fetal shoulders and once the practitioners involved realised that the rotational manoeuvres would not dislodge the shoulders, Kim took over and used axillary traction to resolve the problem with almost immediate effect. Despite the head to body delivery interval time being approximately 3 minutes, the baby failed to survive, probably because she was already hypoxic before the insult of the dystocia. The shoulder dystocia would only cause further compromise, and the outcome demonstrates the need to deliver the shoulders as quickly as possible when shoulder dystocia occurs.

The participants in the study felt the major contributing factor to fetal damage was excessive lateral traction, resulting in Erb – Duchenne palsy and the need for more prolonged resuscitation. The number of manoeuvres needed to facilitate delivery appears to be related to an increase in fetal trauma, but this is also probably related to the severity of the shoulder dystocia requiring more manoeuvres to effect delivery. In their experiences, delivery of the posterior arm was associated with humeral fracture, which further compromises the baby as a result of shock. The participants favoured the use of axillary traction as none of the babies suffered physical trauma or the need for prolonged resuscitation techniques. This seems to be true when axillary traction alone had been used and the fetus had never been subjected to excessive lateral traction or repeated attempts at rotational manoeuvres.

Sally found that using axillary traction alone when faced with a shoulder dystocia reduced the head to body delivery time.

> *They take too long and every second counts when a baby is in that situation… all of that fiddling around.*

Her anxiety around the time the rotational manoeuvres could take was evident:

> *How can you waste time when a baby might die?*

Sally believes that the Woods screw and posterior arm delivery manoeuvres take too long to perform, with no assurance of success. When she used axillary traction alone she found that the babies were always in surprisingly good condition. This is probably because the fetal blood pH level falls once the head is delivered (Wood et al., 1973), and there may also be cord compression (Flamm, 1999), so reduction in the head to body delivery time optimises fetal outcome. Sally also found that after many years of experience - and many shoulder dystocias - she resorted to axillary traction as a first line management strategy and never used excessive traction on the fetal head:

> *I've seen people pull on the head and I've thought, 'Don't do it!' Whereas you could have pulled on the shoulder with so much less damage.*

Sally had witnessed the poor neonatal outcomes associated with excessive pulling, in particular brachial plexus injury, some of which had been permanent.

Alan supports Sally's views and recognises the benefits of using axillary traction:

> *You find your finger in the axilla and you think, Right. I've got hold of something that isn't going to damage the baby.*

The literature describes the adverse effects of pulling on the fetal head, but the practitioners in this study found that they could apply traction to the fetal axilla, and despite the degree of traction required, it did not seem to cause any injury. In one case, brachial plexus injury was seen following the use of axillary traction, but it was only after other manoeuvres had been attempted and excessive lateral traction had been used. Kim describes her experience:

> *The woman was in lithotomy… The midwife was pulling and pulling on the head. I went in and got the baby out using axillary traction and the baby's APGAR's were… low at first, and he took a while to recover. He didn't need to go to Special Care, though… However, when I looked, the baby had Erb's palsy. But then I realised that it was not on the shoulder that I had done axillary traction on; it was on the side where the shoulder had been trapped under the symphysis, and it was obviously caused by the stretching of the neck.*

Kim had answered an emergency assistance call. The clinician who called for assistance was clearly trying to overcome the obstruction by pulling harder. At this point Kim was unclear as to whether any other manoeuvres had been attempted, but she recognised the severity of the situation as the fetal head was extremely discoloured and the turtle sign was evident. As the woman was already in the lithotomy position, Kim asked for the legs to be pulled back further so that she was in McRoberts position. Kim entered the vagina posteriorly and located the posterior shoulder, which was above the pelvic brim. The shoulder grasped was the right shoulder of the baby, and the left shoulder was impacted behind the symphysis pubis. Using axillary traction and a good deal of effort, Kim was able to move the posterior shoulder into the pelvic cavity. Then - by continuing the traction and following the curve of the sacrum - she was able to deliver the posterior (right) shoulder over the perineum, using the symphysis pubis as a

‘fulcrum’ for the anterior (left) shoulder. Once the posterior shoulder was freed, the anterior shoulder easily slipped under the symphysis pubis. Kim couldn’t recall the APGAR scores, but remembered that the baby required resuscitation and took a couple of minutes to breathe spontaneously. He also had an Erb - Duchenne palsy of the left arm. The palsy occurred in the shoulder that had been impacted behind the symphysis pubis, not the shoulder to which axillary traction has been applied. The palsy was probably caused by the excessive traction that was used before Kim arrived in the room, which is consistent with reports in the literature in relation to brachial plexus injury.

The participants in this study all found that when axillary traction alone was used, the neonatal outcome appeared much improved. This may be because this manoeuvre - when used a first line management strategy - reduces the head to body delivery interval, thereby reducing the risk of hypoxia. Those babies requiring resuscitation also appeared to recover more quickly, indicating that they were not in the terminal apnoea stage, unlike the babies who were subjected to various manoeuvres including excessive traction and delay in the birth time. It may also be that traction applied to the axilla does not cause harm to the fetus, unlike traction applied to the head, which damages the cervical nerves. It seems also that the traction required to deliver the shoulder varies depending on the severity of the shoulder dystocia.

The practitioners in this study have all been taught to manage shoulder dystocia using the HELPERR mnemonic, and this is what they see used in practice. They have found, however, that following the mnemonic often does not work, and in fact may even cause more harm to the baby. Thus they seem to be following their own intuitive/thinking response rather than acting reflexively. Their own sensate perceptions of a given situation are leading them towards the use of axillary traction as a method of resolving shoulder dystocia, which they feel reduces the level of risk for the baby.

## Conclusion

The study participants were very clear that one of the major problems that occurred when managing shoulder dystocia was that practitioners continued to pull on the fetal head, even when this manoeuvre was clearly not working. This appears to have been a reflex response on practitioner’s behalf, in an attempt to overcome the obstruction. The study participants identified that this alone caused more problems, leading to brachial

plexus injury in the baby and a greater need for resuscitation. Fractures of the humerus had been seen when there had been attempts to remove the posterior arm.

When axillary traction alone was used, the babies who required resuscitation recovered more quickly, indicating that the hypoxial insult was less. None of these babies suffered brachial plexus injury or indeed any other physical injury.

Following the mnemonic seemed to inhibit the practitioners' ability to trust their own judgment or intuition to resolve the problem. When the participants in the study did follow their own instincts, however, it seemed more natural and easier to grasp the baby by the axilla and not by the humerus. Once they grasped the axilla, they found that traction was simple to perform, effective in achieving delivery of the shoulder and took less time than the sequence of manoeuvres described in HELPERR.

# CHAPTER SEVEN

# Effect on the Practitioner

## Introduction

Any practitioner who has cared for a woman when a major shoulder dystocia has occurred will understand the horror of the situation. One moment all appears well and the head is delivered. The next moment the fetal head retracts and becomes more and more discoloured. Frantic efforts are made to deliver the shoulders and the time between head and body delivery seems like an eternity. The baby is often born in poor condition requiring resuscitation. Everyone involved suffers from shock and trauma.

In this chapter the participants describe their feelings and the possible psychological sequelae for health professionals following such an experience. These effects relate to not only the practitioner dealing with the problem but to those practitioners who are trying to support others who have been involved in cases where the outcome has not been favourable.

## Effect on the Practitioner

Sue had been involved with a woman for whom pregnancy was the result of invitro-fertilisation (IVF) following infertility for 7 to 8 years. The woman had been pushing for more than an hour when it was decided that a forceps delivery should be conducted in the operating theatre. She describes the feelings of disaster she experienced:

> *So there was a forceps delivery in theatre and the head came out, [but] he couldn't get the shoulders out. And I just remember standing there on the right side of the bed, and the GP was on the other side of the bed, and the specialist was trying the anterior shoulder,[then] the posterior shoulder, [then] the anterior shoulder, [then] the posterior shoulder, and he just couldn't get the baby out. I remember looking at the paediatrician who was obviously getting a little bit 'oh, oh', and I remember thinking, 'Holy s**t. This baby is going to die in front of our eyes.' I remember this horrible thing of doing suprapubic pressure – I think the GP was doing it at that stage - and just this awful feeling of impending disaster and almost a sense of panic starting to build in me. I didn't panic and no-one panicked, but this horrible feeling of being absolutely*

*able to do nothing. This was a wonderful specialist - in fact it was a specialist I would trust with my life and trusted with my life later on actually - but he just couldn't get this baby out.*

Sue recalls the Specialist putting his hand in posteriorly and trying to break the clavicle without success. He pulled and pulled until the baby eventually delivered. The baby required resuscitation and survived, but suffered an Erb - Duchenne palsy. Sue recalls her feelings following the event:

*I can remember just being horrified. I can just remember thinking, 'Hells teeth! I'm going to have to deal with this one day'.*

Sue's recollection of events was vivid, as were her recollections of the terrible feelings she had on thinking that the baby was going to die in front of her eyes. As a relatively inexperienced practitioner at the time, she felt helpless and unable to do anything to resolve the situation. Her feeling of impending disaster - because she feared for the life of the baby - is evident. She also describes a sense of panic starting to build inside, and yet she states that she did not panic. It is probable that although she did not display the actions of someone who is panicking, she still felt the sense of overwhelming fear. The events of that day left Sue thinking about them for a number of years afterwards. She remembered the horror she felt and often spoke about it to other practitioners.

Sue's ability to recall the story so vividly demonstrates the effect the experience had on her. The repeated thinking probably means that she was 're-experiencing' the event for a significant length of time following its occurrence. This indicates that Sue was probably suffering from psychological trauma, as re-experiencing symptoms are a sign that the mind is actively struggling to cope with the trauma.

Some years later, Sue was caring for her own client in the Delivery Suite when a new graduate midwife was involved with a shoulder dystocia. The woman was in labour with her second baby. Her first pregnancy had been uneventful and she had a normal delivery of a baby weighing just less than nine pounds. The new midwife rang for obstetric assistance when there was delay in the second stage. The obstetrician and a senior midwife were in attendance when the shoulder dystocia occurred. The baby was

eventually delivered by removal of the posterior arm, fracturing the humerus. Sue describes the resuscitation:

> *The paediatrician - after 20 minutes of trying to resuscitate it - stopped the resuscitation. [But] then recommenced the resuscitation because, after he'd stopped, he had a final listen [and found] there was a heart beat that was picking up. So now he was in a position where he had to recommence the resuscitation. The baby went off to National Women's and it went into that head cooling study, and everyone thought that this baby was going to be a complete 'goner' because it was just so dreadful. But, anyway, he recovered and, as far as I know, he's actually done quite well.*

Sue provided support for the new midwife, who was clearly very upset at the outcome, and as a result the new midwife asked Sue to continue to support her over the following weeks:

> *The situation with the dystocia was dreadful. There was a meeting at the hospital between senior people at the hospital and the midwife and the family. The family blamed the midwife entirely. In fact, she had consulted, she had the Specialist there and she had a senior midwife with her. If she hadn't done any of those things I think they wouldn't have a live baby, but their perspective was that it was the midwife's fault and the woman should have had a caesarean section. In actual fact the baby was only just slightly bigger than the first baby. Anyway, the outcome for the baby was good, but the outcome for the midwife was that it was the end of her career because it was devastating for her to be sitting at a table with the baby's grandmother shouting, 'You should be struck off!'… It was dreadful… The grandmother yelled at me too – she was furious and full of blame, and it was everyone's fault. And she kept saying, 'This baby should have had a caesarean section'. Really there were no indications and - like most shoulder dystocias - it was just one of those things that happened.*

What Sue describes is a terrible situation where the new midwife was subject to the understandable anger and grief of the baby's relatives. The anger toward the new midwife was misplaced because she would have been unable to predict the events of the birth and she had consulted appropriately with senior practitioners in attendance.

Sue recalls having discussed the events with the Midwife and with the Specialist concerned on a number of occasions following the dystocia. They were all trying to make sense of what had happened. This talking is almost an attempt at de-briefing in an informal way in order to bring some closure to the incident. This situation highlights the importance and need for critical incidents to be handled effectively so that neither the family's nor the practitioner's lives are destroyed by the event.

Sally and Kim describe their feelings following a very traumatic shoulder dystocia in which they were both involved. Sally eventually delivered the baby after a senior practitioner was unable to do so. Sally describes her fear during the incident:

> *I do believe that adrenalin kicks in. Terror kicks in… when you see a baby that may well be dying in front of your eyes. That was the most terrifying shoulder dystocia I've ever had because the whole thing must have taken probably seven minutes. Seven minutes in a baby's life at that critical stage is very, very crucial. It was probably the most frightening experience that I've ever had.*

The baby needed resuscitation, had a fractured humerus and subsequently suffered from seizures. Years later, Sally was able to recall the events and outcome of the birth with absolute clarity. Her clear description of the fear she felt highlights the effect the incident has had upon her.

Kim recalls how both she and Sally behaved following the incident:

> *We were both severely traumatised by the whole thing. Neither of us slept for nights afterwards because your brain kind of doesn't stop, and you keep seeing it over and over again.*

Sally and Kim talked on a regular basis following the incident and provided support for each other. Kim describes how they both were unable to sleep for some time afterwards 'seeing' the sequence of events over and over again. What Kim describes is how their minds were working to bring closure to the incident. This continuing to run a 'memory track' is commonly seen in post-traumatic stress as the mind tries to apply logic to and make sense of the incident. This 'turning over' of events continues as the mind feels

satisfied that the incident had made sense, and the person feels they have regained order and control of the situation (Hall et al., 1997).

The types of trauma and stress that practitioners experience when birth 'goes wrong' can result in long term psychological symptoms and problems. How severe the symptoms are depends upon the person, the type of trauma involved and the emotional support they receive afterwards. It is important to remember therefore that colleagues who suffer traumatic events may need critical incident debriefing sessions and support to enable them to return to their daily work with a lessened risk of experiencing post traumatic stress. Without this we risk losing practitioners from the profession as well as long term psychological damage.

## Conclusion

It would be understandable that experienced practitioners - who over many years have cared for a great number of women in labour - would not be able to recall the exact events that occurred at many of the births they have attended. The participants in this study, however, could recall and describe with absolute clarity the events of the births in which shoulder dystocia occurred. It was as if it had happened yesterday. Some of them subsequently experienced the repeated 'seeing' of the sequence of events and the inability to sleep, whilst others felt the need to continually de-brief in order to make sense of the situation. One midwife left the profession as a direct result of events which occurred during and after the shoulder dystocia.

This demonstrates that practitioners, who are involved with severe shoulder dystocia, particularly when the outcome is poor, are at risk of suffering from post-traumatic stress and psychological damage, which can result in loss of the practitioner from the profession.

# CHAPTER EIGHT

# Discussion and Conclusion

## Introduction

This chapter presents the research question and aims, and shows how these have been addressed. The research findings are summarised and recommendations for changes in clinical practice and education are made. The existing knowledge regarding management of shoulder dystocia, and the ways in which the results of this study have contributed further to this body of knowledge, are presented. The result is that an alternative method for managing shoulder dystocia has been developed. Recommendations for introduction of the new management strategy into clinical practice and education have been suggested, together with identification of the implications for further research. The limitations of this study are acknowledged before the final conclusion.

## The Research Question and Aims

The research question of this study focused on the current management of shoulder dystocia and the possibility that an alternative method could better optimise outcomes. To provide an answer to the research question, the participants shared their experiences with regard to how they were taught to manage shoulder dystocia, the effectiveness of those strategies and what they found to be most effective for managing the problem. They disclosed their feelings about the effect that shoulder dystocia had on them personally, as well as their colleagues. They also described the outcomes for the babies they have observed who have suffered from shoulder dystocia.

The research aims have been addressed in the following ways:

**Aim One***: To identify how practitioners managed shoulder dystocia before the teaching of the HELPERR management strategy and how the introduction of that strategy has influenced their practice:*

The participants describe how they managed shoulder dystocia before the formal training of HELPERR began. Less experienced practitioners learned from those with

more experience that turning the woman into left lateral or onto all fours often resolved the problem. There was no formal training for the management of shoulder dystocia, so practitioners learned from each other. Although the practitioners may not have been aware that positional change increases the pelvic dimensions (Simpkin, 2003), they recognised that positional change somehow seemed to dislodge the shoulders.

Once the HELPERR management strategy for shoulder dystocia was introduced into formal obstetric training sessions, a systematic approach to managing the problem was encouraged (Neill & Thornton, 2000; Simpson, 1999). HELPERR became an 'authority' in practice because it was validated by publication in medical literature (RCOG, 2005). As a result, practitioners found that their own practice - and that of others - became influenced by HELPERR, which was viewed as the best way to manage the problem of shoulder dystocia. This also meant that the practitioners did not adopt the all fours position until the other manoeuvres in the HELPERR mnemonic had been tried, simply because this was the last manoeuvre to be mentioned (R – Roll). This occurred despite the fact that the all-fours position was evaluated as being the most effective (Bruner et al., 1999). The effect that HELPERR has had on the practitioner, therefore, is to encourage them to follow the mnemonic in the order that it is presented.

**Aim Two:** *To identify how effectively the participants were able to manage shoulder dystocia using the manoeuvres described in HELPERR:*

The participants describe the difficulties they faced when trying to perform some of the manoeuvres described in HELPERR. When attempting McRoberts position, difficulty was found in abduction of the legs when the woman was obese. Suprapubic pressure proved to be impossible when maternal obesity prevented access to the symphysis pubis. All fours position could not be adopted when mobility was compromised either by epidural anaesthesia or obesity. An important finding of this research is that McRoberts position and suprapubic pressure (Rubins I manoeuvre), which have been objectively evaluated as being effective are not appropriate for all women.

It is necessary to access the anterior shoulder to perform Rubins II manoeuvre, where two fingers are inserted into the vagina behind the anterior fetal shoulder which is then pushed towards the fetal chest (ALSO, 2000). The aim is to reduce the bisacromial diameter by adducting the shoulder (Baxley & Gobbo, 2004). The findings from this

study are that both access to and movement of the anterior shoulder are very difficult and in some situations impossible. This makes Rubins II manoeuvre ineffective in resolving shoulder dystocia in some cases.

Some of the practitioners describe the difficulty they had in remembering the HELPERR manoeuvres and the confusion they had witnessed in other practitioners trying to remember the HELPERR sequence in the clinical situation. If practitioners become confused, or are unable to remember what to do in an emergency situation, that situation clearly becomes compromised.

The data from this research highlights the need for an approach to managing shoulder dystocia that is a simple and effective manoeuvre, and one that can be adopted in any situation or circumstances.

**Aim Three:** *To identify alternative methods of managing shoulder dystocia and compare the effectiveness of a new strategy with that of the HELPERR strategy.*

The participants learned during their experiences of shoulder dystocia that it was very easy to access the posterior shoulder by putting a hand into the vagina posteriorly. By following the contour of the fetus and sliding a hand down into the posterior aspect of the pelvis, the whole hand could be admitted. The fetal shoulder could then be grasped by hooking a finger underneath the axilla and *axillary* traction applied to move the shoulder through the pelvis.

The data shows that both unilateral and bilateral shoulder dystocia can be resolved using axillary traction. In unilateral shoulder dystocia, the *posterior* shoulder will have entered the pelvic cavity. Once that shoulder has been grasped, axillary traction can be applied and the shoulder brought through the curve of the sacrum as the anterior shoulder pivots around the symphysis pubis. Once the posterior shoulder is delivered, the anterior shoulder slips under the symphysis pubis easily. If the shoulder dystocia is bilateral, neither of the shoulders have entered the pelvic cavity. This situation requires a slightly different manoeuvre in that some rotation may be required. Even though the shoulders are above the pelvic brim, it is still possible to grasp a shoulder using the space in the pelvic cavity, allowing the practitioner's hand to be admitted. It is important to grasp the shoulder from behind, which can be achieved by sliding a hand

down the back of the baby. The fetal shoulder should be rotated towards his body so that the bisacromial diameter is reduced. As the fetus rotates, and downward traction is applied through the axilla, the shoulder will deliver once it reaches the larger oblique diameter of the pelvis. It may be necessary to repeat the manoeuvre as described for unilateral dystocia on the remaining shoulder, as this may remain high in the pelvis. In both cases, the degree of traction required will depend upon the severity of the shoulder dystocia.

**Aim Four:** *To determine the risk of injury to the baby when using the HELPERR management strategy compared to the use of an alternative strategy:*

In the HELPERR strategy, gentle lateral traction on the fetal head is recommended in conjunction with suprapubic pressure. In this study, however, it was found that pulling on the fetal head was the factor that damaged babies the most. The practitioners in this study did not witness gentle traction; the reflex response on behalf of the practitioner encountering shoulder dystocia is to pull harder in an attempt to overcome the obstruction. Excessive traction on the fetal head can cause clavicular fracture and brachial plexus stretch injury, which can result in Erb-Duchenne or Klumpke palsies, Horner's syndrome, or less commonly facial nerve injury or diaphragmatic paralysis (Gherman et al., 1999). This study found that when axillary traction alone was used and the fetus had not been subjected to excessive traction, then brachial plexus injury and clavicular fractures were not seen.

Continued pulling on the fetal head also seemed to result in a greater need for resuscitation. This is probably because the fetus has not only been subject to brachial plexus stretch but a more prolonged the head to body delivery interval, which is linked to an increased hypoxial insult to the baby. The baby is therefore more likely to be born in the stage of terminal apnoea, which means that resuscitation is more difficult and neurological sequelae more likely (Baskett & Allen, 1995). Some of the practitioners in this study had used axillary traction as soon as the shoulder dystocia was recognised and had not attempted lateral traction. The use of axillary traction meant that the fetus was *moved* through the pelvis, rather than *forcibly pulled* through the pelvis. The result was that the head to body delivery interval was reduced and - although still requiring resuscitation - the babies were born in the stage of primary apnoea and were resuscitated

more quickly. The risk of physical or neurological injury therefore is much less than that of a baby born in the stage of terminal apnoea (Gurewitsch, 2077).

The HELPERR management strategy advocates delivery of the posterior arm, where the posterior arm is located, the elbow flexed and the forearm delivered across the chest in a sweeping motion. It is associated with a high incidence of humeral fracture (Gherman et al., 1998b). One of the study participants has used this manoeuvre successfully to resolve shoulder dystocia, but three of the participants had experienced the baby suffering humeral fracture when this was used. None of the participants who had used the axillary traction only - where there was no attempt to remove the arm - had seen any neonatal fracture.

**Aim Five:** *To highlight the effect that shoulder dystocia has on practitioners encountering the problem:*

All of the practitioners in this study were vividly able to recall the details of their experiences with shoulder dystocia, regardless of the length of time that had passed since the occurrence. This in itself demonstrates the impact that shoulder dystocia has on the practitioner. Their feelings of fear and horror during the shoulder dystocia are evident, with a risk that some practitioners can suffer long term psychological trauma. One of the participants suffered from re-experiencing the events, which is a sign that the mind is actively struggling to cope with the trauma, something that is seen post-traumatic stress syndrome (Hall et al., 1997). Two of the participants suffered from insomnia for a number of nights following the incident. A colleague of one of the participants left the midwifery profession because she was unable to cope, not only the trauma of the actual event, but also the on-going events following a poor outcome.

## *Summary of Research Findings*

This study found that the ‘old’ ways of managing shoulder dystocia have been superseded by HELPERR. This has influenced the way in which practitioners manage shoulder dystocia, now commonly following the sequence and order of manoeuvres described in HELPERR. This seems to be because HELPERR has been validated by publication in medical literature and being taught in obstetric emergency training sessions. This continues in practice today, despite the fact that practitioners find some of the manoeuvres difficult to remember or to perform, which can make the manoeuvres

less effective in resolving the issue. These difficulties highlighted the need for a simple and effective manoeuvre that could be used in any circumstance.

Axillary traction was identified by the participants as being the most effective and efficient way of managing shoulder dystocia that does not respond to McRoberts manoeuvre and suprapubic pressure. This manoeuvre was one that the participants had learned 'by accident' during the course of their experiences. The findings of this study are that physical and neurological injuries to the baby are less likely to occur - and recovery following resuscitation more rapid - when axillary traction is the method used for resolving shoulder dystocia, compared to the HELPERR management strategy.

This study also found that practitioners who are involved with shoulder dystocia - particularly when the outcome is poor - are at risk of suffering from post-traumatic stress and psychological damage, which can result in loss of the practitioner from the profession.

## Recommendations for Practice

The results of this study demonstrate that the actions to be taken in the event of shoulder dystocia should be reviewed. Once shoulder dystocia occurs it is important to focus on *moving* the baby rather than *pulling* on the baby. In order to do this it is helpful to place the woman in the McRoberts position so that the pelvic outlet is maximised (Poggi et al., 2004) and the uterine pressure and strength of the contractions are increased (Buhimschi et al., 2001). As this manoeuvre is successful in approximately 42% of shoulder dystocias (Gherman et al., 1997), this may be all that is required. McRoberts manoeuvre, performed with suprapubic pressure, improves success rates to 54.2% - 58% (Gherman et al; Gherman et al., 1998b).

If McRoberts manoeuvre and suprapubic pressure are unsuccessful it is important not to waste time. Practitioners should progress immediately to axillary traction in order to move the fetal shoulders, as follows:

- Enter by sliding a hand, along the back of the fetus, into the posterior aspect of the pelvis.
- Locate the posterior shoulder by grasping from behind. The index finger is placed under the axilla and the second finger placed on the upper part of the fetal

humerus to secure the arm against the body. The thumb is placed on top of the shoulder.

- If the shoulder is in the posterior half of the pelvis (i.e. shoulders are in the A-P diameter), apply axillary traction to follow the curve of the sacrum. In doing so, the anterior fetal shoulder will 'pivot' around the symphysis pubis and the posterior shoulder will be delivered first.
- If the shoulders are in the transverse diameter of the pelvis - rotate to the nearest oblique diameter and apply axillary traction until the shoulder is freed. The above manoeuvre, (for unilateral shoulder dystocia), may need to be repeated for the remaining shoulder in this case.
- Apply the necessary degree of traction to move the baby through the pelvis. This may be very strong traction, but is unlikely to harm the baby as the traction applied is *through* the axilla rather than *against* the fetal structures, which happens when strong traction is applied to the fetal head or humerus.

The practitioners in the study found that axillary traction had been the manoeuvre they found most successful and they did not need to resort to anything else. If it is not successful at the first attempt, however, then it would be appropriate to move the woman into the all-fours position and attempt axillary traction again.

These three simple steps of McRoberts, suprapubic pressure and axillary traction could revolutionise the way in which shoulder dystocia is managed.

## Recommendations for Education

Shoulder dystocia training currently takes place in obstetric emergency skills training such as the Advanced Life Support in Obstetrics training for midwives and medical staff and in the mandatory midwifery technical skills workshops. The benefits of such training sessions are proven (Draycott et al., 2008) and should continue on a regular basis so that staff remained up-skilled in management of all obstetric emergencies. Training sessions for shoulder dystocia should include the following:

**Individual Assessment:** Practitioners should always assess the individual circumstances of each client. Factors such as high maternal BMI - which may prevent the woman from adopting the McRoberts position or prevent the practitioner from accessing the symphysis pubis area to apply suprapubic pressure - can be easily

assessed during labour. Reduced mobility may be due to maternal body habitus, epidural anaesthesia or lithotomy position, thus the possibility of positional change can be easily assessed before the birth. These factors should be kept in mind, so that if shoulder dystocia does occur, the practitioner does not waste time trying techniques such as positional change into the all-fours position when it would take an unacceptable length of time to achieve.

**Axillary Traction:** This study has demonstrated that practitioners tend to carry out manoeuvres in the order in which the HELPERR mnemonic suggests, even though this is not necessarily the order in which they should be instituted. This systematic use of HELPERR means the head to body delivery interval may be even further prolonged. The benefit of the three simple steps described above is that they are easy to remember, easy to perform and are always carried out in the same order. Education should focus on how to perform axillary traction as a way to *move* the baby through the pelvis, as it is the movement of the shoulders through the pelvis which resolves the dystocia without injury; *pulling* the baby does not resolve the problem and is more likely to result in neonatal injury.

**Teamwork Principles:** The importance of a multi-disciplinary teamwork approach to training in obstetric emergency procedures should be included in education sessions, as such training has been associated with improved clinical outcomes (Siassakos, Crofts, Winter, Weiner & Draycott, 2009). To improve effectiveness of the team approach, clinical management guidelines for shoulder dystocia should be developed. The guidelines should ensure that:

- All learners are aware of the reasoning behind the management steps being taught.
- The sequencing of management techniques taught should be reviewed on a regular basis, as it is the most effective at resolving the problem and reducing neonatal injury.
- Team responsibilities are taught where specific roles are assigned during the emergency, such as one person to direct/co-ordinate the emergency, one to summon assistance, one at the perineum performing the manoeuvres, one to perform suprapubic pressure, one tracking time and one documenting events.

**Documentation:** Documentation tools for shoulder dystocia should be developed to ensure that the management of the shoulder dystocia is recorded as thoroughly, accurately and honestly as possible. A generic outline should provide guidance on how to achieve this, and should include:

- Date and time that the records are written.
- Who was present and who was called to the birth.
- Use, type and reason for episiotomy if performed.
- Time of delivery of the head.
- Position of the vertex at delivery.
- Evidence of turtle sign and restitution of the fetal head.
- Position and changes in position of the mother, which includes any difficulty with positional change.
- A full description of the manoeuvres used and the time spent on each manoeuvre, including whether the shoulder dystocia was unilateral or bilateral.
- Evidence of nuchal cord.
- Time of delivery of the body.
- Newborn weight and APGAR scores.
- Any maternal injuries and conditions.

Accurate documentation will improve accuracy of the reported incidence of shoulder dystocia, as well as reducing the risk of liability that practitioners currently face when shoulder dystocia occurs and the neonatal outcome is poor.

**Debriefing:** The practice of post shoulder dystocia debriefing with the parents should be taught to practitioners. Good communication between all parties will help to resolve issues or misconceptions that the parents may have and possibly help to reduce the incidence of post-traumatic stress and legal claims. The principles of debriefing should also include all practitioners involved in the emergency, and should take place in a safe and supportive environment. This will help to ensure that the emergency was dealt with appropriately and allows management guidelines to be evaluated and reviewed. Practitioners suffering from post-traumatic stress following the incident can be identified, and subsequently assisted and supported.

## Implications for Further Research

This study identifies the need for further research into the art of managing shoulder dystocia. The true incidence of shoulder dystocia cannot be defined in the absence of a clear definition, so a set of indicators should be used to provide a universally accepted definition. Currently the term 'tight' shoulders is often documented in the clinical notes which does not accurately reflect whether or not there was a true shoulder dystocia. Further investigation is required to identify different grades of shoulder dystocias that are based on clinical signs and events, such as prolonged head to body delivery time, the presence of the turtle sign and failure of one or both of the shoulders to enter the pelvic cavity. Definitions that are based on the number of manoeuvres required to effect delivery of the shoulders may be less accurate because of the differing levels of experience of the birth attendants, which can affect management of the problem.

The rotational manoeuvres described in HELPERR - Rubins II, Woods screw and reverse Woods screw manoeuvres, as well as removal of the posterior arm - have not been objectively evaluated. As these manoeuvres are included in the currently accepted teaching of the HELPERR strategy, it is important that their effectiveness is evaluated. This study suggests that axillary traction alone could be used, instead of any or all of these manoeuvres. Rotational manoeuvres and delivery of the posterior arm should be compared with axillary traction. Outcomes measures - such as difficulty in performing the manoeuvres, head to body delivery time, neonatal injury that is either transient or permanent, the need for neonatal resuscitation and maternal injury - should all be evaluated.

The effectiveness of shoulder dystocia training sessions also needs to be evaluated. Clearly identified goals and objectives - such as place of training, how often sessions should take place, training evaluation and debriefing tools - will provide outcome measures for the training sessions. Measurement of the maternal and fetal sequelae from shoulder dystocia following training sessions, as compared to prior to the sessions, will give an indication of their effectiveness. Furthermore, the effectiveness of documentation tools in reporting the problem should be audited and evaluated. Along with a clear definition, this would provide more accurate information as to the incidence of shoulder dystocia and evaluation of the methods used to resolve the problem.

Finally, the psychological sequelae for both parents and practitioners following shoulder dystocia should be researched so that we have true indication of long term effects following the problem. This would enable appropriate counselling and debriefing strategies to be implemented.

## Limitations of the Study

The limitations of this study are that the sample size of five practitioners was small, thus allowing the generalisability of the findings to be challenged due to the subjective nature of the inquiry. It is important, however, in qualitative research to select samples with a high potential for 'information richness' so that many experiences are revealed. Selecting such a sample ensured that the data generated for analysis was large, even though the sample size was small.

As a midwife researcher with deep understanding of the phenomena under study, I was aware that the study participants may have discussed aspects of shoulder dystocia that they perceived I would want to hear about. In order to ensure that I didn't lead the participants, I concentrated on using open ended questions and followed an informal interview guide.

It is also acknowledged that the practitioners selected for inclusion in this study were all experienced practitioners working in tertiary hospital settings and exposed to large numbers of labouring women. Had this study included less experienced practitioners with less exposure to shoulder dystocias, the findings would have been different. But in doing so, the data in this case would not have been so rich and meaningful, and capable of yielding information that clarified the multiple dimensions of the phenomena of shoulder dystocia.

## Conclusion

The research question that focused on the current management of shoulder dystocia and a possible alternative method has been answered by this study. Practitioners' pre-HELPERR knowledge of how to manage shoulder dystocia became invalidated by the introduction of the mnemonic that has been widely adopted as 'the way' to manage shoulder dystocia. In practice, however, practitioners have found that the mnemonic is difficult to remember, that some of the manoeuvres are difficult to perform and, more importantly, that some of the manoeuvres simply do not work. The result is that some

babies have been born in very poor condition with physical and/or neurological damage, some of which is permanent.

Axillary traction has been identified as one manoeuvre that is easy to remember, simple to perform and can be used in any circumstance. The three simple steps of McRoberts position, suprapubic pressure and axillary traction have been suggested for use in practice to replace HELPERR. Recommendations for education of health professionals include the individual approach to care, so that practitioners assess each client's individual circumstances before shoulder dystocia occurs. The importance of individual assessment of the woman, guidance on how to perform axillary traction, the principles of teamwork, the importance of documentation and debriefing strategies should be incorporated into obstetric emergency training sessions.

As shoulder dystocia is a problem that practitioners fear, and one which causes a great deal of anxiety when it does occur, it is imperative that they are taught to mange the problem effectively. The findings from this study demonstrate that axillary traction adds to the current body of knowledge about methods of resolving shoulder dystocia. Axillary traction is a simple manoeuvre that can be used to resolve shoulder dystocia with relative ease, and can be used in any situation or circumstance. The value of axillary traction as a method for resolving shoulder dystocia is the most important finding from this study. In the words of Anna at the end of her interview:

> *Imagine if we just taught McRoberts, suprapubic pressure and then axillary traction.* ***That's it… it really is that simple!*** *Just think how many babies would be so much better off!*

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