Training for obstetric emergencies: PROMPT and shoulder dystocia

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March 2015
Introduction

Shoulder dystocia is an unpredictable and therefore largely unpreventable emergency complication of vaginal birth. Shoulder dystocia is associated with risks to both mother and baby, particularly injury to the fetal brachial plexus. Effective, multi-professional team working is essential for the successful management of shoulder dystocia and although some training has been demonstrated to improve neonatal outcomes, there is conflicting evidence of effect. The Royal College of Obstetrics and Gynaecology (RCOG) guideline recognises that, in line with the PROMPT programme: ‘Shoulder dystocia training associated with improvements in clinical management and neonatal outcomes was multi-professional, with manoeuvres demonstrated and practiced on a high fidelity mannequin. Teaching used the RCOG algorithm (Box 1) rather than staff being taught mnemonics (e.g. HELPERR) or eponyms (e.g. Rubin’s and Woods’ screw)’. 

What is shoulder dystocia?

Shoulder dystocia is defined as a vaginal birth that requires additional manoeuvres to deliver the baby after routine traction fails to release the shoulders. Most commonly, the anterior fetal shoulder impacts on the maternal symphysis pubis preventing birth of the body.

The reported incidence of shoulder dystocia is variable, estimated at between 0.58% and 0.70% in the largest studies. Whilst relatively uncommon, shoulder dystocia has been associated with both poor neonatal outcomes and increased maternal morbidity; some of which is preventable. This preventable morbidity accounted for 5% of the successful litigation in a recent NHSLA review.

What are the consequences of shoulder dystocia?

Maternal

Shoulder dystocia can be frightening for staff and parents especially where there is poor communication between staff and the mother. Moreover, shoulder dystocia is associated with an increased risk of postpartum haemorrhage as well as third and fourth degree tears.

Neonatal

Delay between delivery of the fetal head and body can lead to cord compression and fetal hypoxia. Whilst a healthy fetus will initially compensate, as the head to body delivery interval increases, the risk of severe acidosis and development of hypoxic ischaemic encephalopathy increases. If the fetus is in a good condition before birth, the risk of significant hypoxic injury is small when the head to body delivery interval is less than 5 minutes.

The most important neonatal complication is brachial plexus injury. It has been estimated that 1 in 2300 births in the UK are affected by a permanent brachial plexus injury.

- Erb’s palsy is the most common form of brachial plexus injury; the infant is unable to abduct or externally rotate the arm, or supinate the forearm, resulting in a classic ‘waiter’s tip’ appearance. Fortunately, up to 90% of Erb’s palsies recover by 12 months of age.

- Klumpke’s palsy, a lower brachial plexus injury, is less common. This results in a limp hand and the infant being unable to move the fingers. The recovery rate of this injury is much lower, with around 40% resolving by 12 months.
In approximately 20% of brachial plexus injuries, there is complete paralysis of the arm with total sensory and motor deficit. This may also be associated with Horner’s syndrome, in which there is permanent pupillary constriction, ptosis of the eyelid and anhydrosis of the affected side.

Shoulder dystocia can also result in humeral and clavicular fractures, which usually heal quickly with no long-term consequence.

**Can we predict shoulder dystocia?**

Whilst several antenatal and intrapartum characteristics have been reported to be associated with shoulder dystocia, the majority of cases occur in women with no risk factors.

Shoulder dystocia in a previous birth particularly increases the risk of shoulder dystocia, with rates reported to be 10 times higher than the rate in the general population.

Macrosomia, maternal diabetes mellitus and obesity, and operative vaginal birth are all associated with increased risk of shoulder dystocia. However, even a combination of risk factors is poorly predictive. Therefore maternity staff should be alert to the possibility of shoulder dystocia in all vaginal births and be ready to expedite the birth with accurate management if shoulder dystocia occurs.

Although it is accepted that shoulder dystocia can be prevented by caesarean section; it has been estimated that an additional 2345 caesarean births would be required to prevent one permanent injury from shoulder dystocia. Accordingly, in both the American Congress of Obstetricians and Gynecologists (ACOG) and RCOG guidance, elective caesarean section is only recommended for women with diabetes and suspected fetal macrosomia (>4.5kg), or where the estimated fetal weight is greater than 5kg in mothers who are not diabetic.

**Multi-professional training for obstetric emergencies**

Obstetric emergencies, including shoulder dystocia, require a rapid and coordinated response from several members of the multi-professional team. Although training for shoulder dystocia typically focuses on the individual skills of the accoucheur, effective multi-professional team working remains essential. Training individuals, rather than teams, may lead to the omission of critical steps. Although it is not possible to prevent shoulder dystocia during vaginal birth; accurate management can significantly reduce complications and training for shoulder dystocia has been recommended for nearly 20 years.

Training is important; shoulder dystocia is uncommon and reductions in working hours mean that staff are even less likely to see this complication. In addition, the manoeuvres are difficult to learn experientially. However, the literature on the effect of training is conflicting: some training for shoulder dystocia has been associated with no clinical effect and some training has even been shown to increase poor outcomes. However, there are also examples of successful training. At least one author has recognised that practice does not make perfect, if it is the wrong practice. Therefore, understanding the underlying concepts and training in the manual skills required to release the shoulders are essential.
Until recently, doctors and midwives attended separate training programmes. This failed to utilise the variety of skills and knowledge provided by the different team members and only served to exacerbate inter-professional barriers. The priority for training should be improved clinical outcomes and patient safety. However, training should also be a non-threatening, enjoyable, and beneficial experience for staff. Multi-professional training should avoid being hierarchical, encourage contribution from all team members and promote positive attitudes. This not only improves communication and safety, but also fosters a more pleasant working environment and may also reduce midwifery sick leave.

However, not all multi-professional training works. Whilst the majority of studies have shown improvements in clinical outcomes, a number have been associated with either no improvement or even an increase in perinatal morbidity. Conversely, training using the established PROMPT (PRactical Obstetric Multi-Professional Training) programme has been shown to improve outcomes for women in Bristol to an extent that ranks it amongst one of the best examples in world literature and it is now spreading globally.

PROMPT is an evidence-based training intervention intended to improve maternal and perinatal care. Evidence from the Simulation and Fire-drill Evaluation (SaFE) study conducted across the South West of England demonstrated improved knowledge, skills and team working in staff following shoulder dystocia training. More importantly direct improvements in neonatal outcomes following multi-professional shoulder dystocia training have been demonstrated. In the first four years of training at Southmead Hospital in Bristol there was a 70% reduction in neonatal injury following the introduction of training to manage shoulder dystocia. A decade of embedded training later, Southmead Hospital has just reported no permanent brachial plexus injuries in 561 cases of shoulder dystocia. Similar results have been replicated in the USA.

PROMPT involves low cost, high fidelity simulation training, which is designed to optimise multi-professional team working. It bridges the gap between theory and real-life, providing hands-on practical training. To more accurately reflect real life, individuals train within their usual professional role and training takes place ‘in-house’. This is not only cost-effective, but allows staff members, who work together, to train together to improve real-life outcomes. Local training allows staff to familiarise themselves with their environment and helps maternity units to identify any local safety problems. PROMPT does not require the use of complex and expensive technology, but rather advocates patient actors and basic props to increase realism. Nonetheless, training of technical skills such as internal manoeuvres at shoulder dystocia can benefit from high-technology simulators such as the PROMPT Birthing Trainer (Limbs & Things) for shoulder dystocia.

PROMPT training also provides an opportunity to implement and disseminate evidence-based guidelines, by encouraging the use of management algorithms, such as the RCOG shoulder dystocia algorithm, and documentation proforma. These tools not only help to standardise practice, but also guide staff to undertake the correct actions; making the right way, the easy way.
Conclusion

Shoulder dystocia is an unpredictable, acutely life-threatening obstetric emergency, with significant risk of harm to the infant if managed inappropriately. Effective and sustainable multi-professional training is crucial in reducing these risks and improving maternity care and safety.

The PROMPT programme has resulted in significant improvements in reducing preventable harm following shoulder dystocia, particularly permanent neonatal brachial plexus injury.
BOX 1: Algorithm for the management of shoulder dystocia

CALL FOR HELP
Midwife Coordinator, additional midwifery help, experienced obstetrician, neonatal team and anaesthetist.

McROBERTS’ MANOEUVRE
(Thighs to abdomen)

SUPRAPUBIC PRESSURE
(end routine axial traction)

Consider episiotomy if it will make internal manoeuvres easier

Try either manoeuvre first depending on clinical circumstances and operator experience

DELIVER POSTERIOR ARM

INTERNAL ROTATIONAL MANOEUVRES

Inform consultant obstetrician and anaesthetist

If above manoeuvres fail to release impacted shoulders, consider
ALL FOURS POSITION (if appropriate)
OR
Repeat all the above again

Consider cleidotomy, Zavanelli manoeuvre or symphsiotomy

Discourage pushing
Lie flat and move buttocks to edge of bed

Baby to be reviewed by neonatologist after birth and referred for Consultant Neonatal review if any concerns
DOCUMENT ALL ACTIONS ON PROFORMA AND COMPLETE CLINICAL INCIDENT REPORTING FORM.
References


17. Semel-Concepcion J et al, Neonatal Brachial Plexus Palsies, Medscape, Jan 2009


