
*Shoulder Dystocia in Australian Aboriginal
Children*

Abstract

Shoulder dystocia is an uncommon medical condition, which turns critical and complex if not managed on time and with the right techniques. It has very low predictive value and cannot, therefore, be anticipated much in advance by medical practitioners. However, some pre-conditions in the mother (physiological, genetic, economic, socio-cultural, etc.) can be the warning signs of an impending shoulder dystocia at labour. These pre-conditions are found to be higher in Australian Aboriginal women as compared to their non-Indigenous counterparts. This is why shoulder dystocia is more prevalent in Australian Aboriginal children than the general population. However, the multifactorial causation and interactions of shoulder dystocia raise hope about the preventive or management techniques and will be discussed in this paper.

Introduction

Shoulder dystocia is a critical but uncommon complication arising during vaginal birth, in which one or both the shoulders of the baby get stuck in the mother's pelvic bone after the head begins to appear (1). The term 'dystocia' means a delivery that is slow or difficult (2). In shoulder dystocia, the delivery is delayed more than usual. Although in most instances of shoulder dystocia babies are safely delivered, it is potentially dangerous for both the mother and the child (3). When the baby is stuck and struggling to emerge, the umbilical cord can be strained, resulting in severe distress for the baby, and it may also lead to lack of oxygen and breathing difficulties (4). So the delivery of the baby will require urgent medical help.

Shoulder dystocia is fairly uncommon, given that it happens in about 1 in 200 deliveries (4). But it can cause complications like brachial plexus injury (commonest), long bone fractures like the collarbone and arm, traumatic CNS damage, etc. in the baby (5). It can also harm the mother by causing postpartum haemorrhage, psychological stress, lacerations, etc. (6). However, medical practitioners cannot predict a shoulder dystocia prior to delivery; it is only after labour starts that they can gauge shoulder dystocia (3). When the doctor notices a prolonged interval in the head to body delivery equal to or more than 60 seconds, a shoulder dystocia is confirmed (7). It is also confirmed when the usual delivery manoeuvres cannot deliver the baby (7). If the doctor anticipates/confirms a shoulder dystocia, he/she will immediately prepare for managing the situation (calling for more help) or recommend a caesarean delivery (3).

Why is Shoulder Dystocia higher in Australian Aboriginal Children?

Not only are the Australian Aboriginals the oldest living culture across the world, they are also a community suffering from the poorest health consequences in comparison to the non-Aboriginals (7). Daily struggles and stress for livelihood, lack of access to safe healthcare services and resources, low socio-economic living, exposure to violence and trauma, and discrimination in the health system towards them are some of the significant factors behind their miserable health outcomes, of which poor maternal health and complicated birthing are some (7).

There has been an increasing burden of diabetes on the Indigenous people and some studies have confirmed that it has reached epidemic levels (8). Globally, more than 50% Indigenous

adults have type II diabetes (9). And diabetes has a direct correlation to shoulder dystocia during labour. Diabetes and diabetes in pregnancy both are considered high risk factors for shoulder dystocia (10). One study (11) found that Indigenous females had higher rates of the various complications of diabetes compared to their non-Indigenous counterparts, irrespective of type I, type II or gestational diabetes. There is an increasing prevalence of diabetes among adult Australian Aboriginals (11) that leads to poor health outcomes and complications in pregnancy (of which shoulder dystocia is one). The Indigenous Australians have a six times higher rate of diabetes than non-Indigenous Australians (about 26%-30%) (12). Pre-existing diabetes in females or gestational diabetes both increase the risk of delivering a large baby (foetal macrosomia) (3). And larger the baby, higher the chances of shoulder dystocia. This is one reason why Australian Aboriginal children are more prone to shoulder dystocia.

Another aspect particularly significant in the Indigenous Australians is obesity. Some researchers studied body type and structure of Australian Aboriginals vis-à-vis the general population of the country. More Aboriginal women were found to be overweight/obese by the standard cut-offs of waist circumference and waist-hip ratio (13). Maternal obesity is highly correlated to foetal macrosomia or having a large baby (7). Thus, Australian Aboriginal children are at a higher risk of shoulder dystocia than their non-Indigenous counterparts.

Australian Aboriginal women were also found to have lower hip circumference compared to the general Australian women (13). Low hip circumference would mean a narrow pelvis, either the android type or anthropoid (14). Android pelvic structures are characteristic of women from Indigenous backgrounds like African-American women (15). Such pelvic structures are at a higher risk of shoulder dystocia during birthing. Wider the pelvis, easier it is for the baby to pass through without getting stuck. Wider pelvis means wider female pelvic canal, smooth passage for the foetus and less chances of shoulder dystocia (16).

Determinants

Some of the significant risk factors of shoulder dystocia are pre-existing diabetes or gestational diabetes, history of foetal macrosomia, maternal obesity, previous shoulder dystocia, post-term delivery (delivering after due date), induced labour, etc. (7, 10). However, it is important to note here that a minimum of 50% of all pregnancies that go on to have a shoulder dystocia at labour cannot be predicted as there are no identifiable determinants during pregnancy (7). The predictive value of any of the known risk factors of shoulder dystocia is less than 10% (7). This

means that shoulder dystocia can happen to any mother and her baby even when they do not have any of the risk factors (2).

Diabetes – This is a medical condition where the human body accumulates too much sugar or glucose in the blood (3). This can be harmful for both the mother's health and the developing baby. A woman can have pre-existing diabetes or get diabetic during her pregnancy (gestational diabetes) (3). Whether pre-existing or gestational, diabetes is always risky for the developing foetus as it overfeeds the baby and makes it grow very large (17). This condition is known as macrosomia or foetal macrosomia (17). Shoulder dystocia is one of the many complicated outcomes of a diabetic pregnancy due to consequent macrosomia (11). Diabetes has been found to be 4 times more prevalent among the Indigenous Australians than the general population (11).

History of foetal macrosomia – A previous case of foetal macrosomia significantly increases chances of another macrosomia. According to one study, 46.7% women who developed foetal macrosomia had a prior history of delivering macrosomic babies as contrasted to only 12.6% in the control group (18).

Maternal obesity – Obesity is a significant predisposition for diabetes development during pregnancy (11). This means that obese mothers are more likely to end up with gestational diabetes and foetal macrosomia and consequently, shoulder dystocia. The high prevalence of diabetes prevalence among Indigenous Australians is directly related to their high rates of obesity, sedentary lifestyles/physical inactivity, poor diet, etc. (11).

Previous shoulder dystocia – Mothers who experienced the event of a shoulder dystocia once, are more likely to experience it again – the recurrence rate of shoulder dystocia is approximately 7 times more than those who never had it before (7). Hence, mothers with previous history of the condition are advised to keep diabetes under control and deliver on time (within the due date) (7).

Post-term delivery – Delayed delivery or post-term delivery increases chances of a large baby. A large baby or macrosomia would anyways enhance the odds of shoulder dystocia manifold (7, 15).

Induced labour – If labour is induced to open the cervix, the doctors would need to use other interventions like the forceps or the vacuum to assist the delivery (3). Assisted vaginal birth is the commonest risk factor for shoulder dystocia (3).

Multifactorial causation and interaction

Any medical condition is a product of more than one cause – assigning a single reason to any disease or medical condition (such as shoulder dystocia) would be an unjust oversimplification, disregarding the social, cultural, psychological, genetic, economic and other aspects of the patient(s) (19). There are many theories of disease causation, however shoulder dystocia is not a disease, but a condition. In this context, the causation theory of Pettenkofer is most pertinent. Pettenkofer suggested that there are always many factors that interact with one another to lead to a certain medical condition/disease (19). In case of shoulder dystocia in Australian Aboriginals, the multiple factors pertain to:

- physiological conditions (diabetes and obesity) (3,11,17),
- economic state (marginalised community living in poverty and having poor food quality) (11),
- genetic predisposition (anatomical drawbacks with android or anthropoid pelvis) (13, 16) and
- socio-cultural life (poor unhygienic living, overcrowding, ignorance, illiteracy, etc.) (20).

All of these above are related to the mothers. But these factors actually interact with each other to generate other factors which can further increase the risk of shoulder dystocia. For example, diabetes and/or obesity (physiological condition) in the mother can lead to foetal macrosomia and the latter can enhance the possibility of shoulder dystocia. Then again, even mothers who are not diabetic or

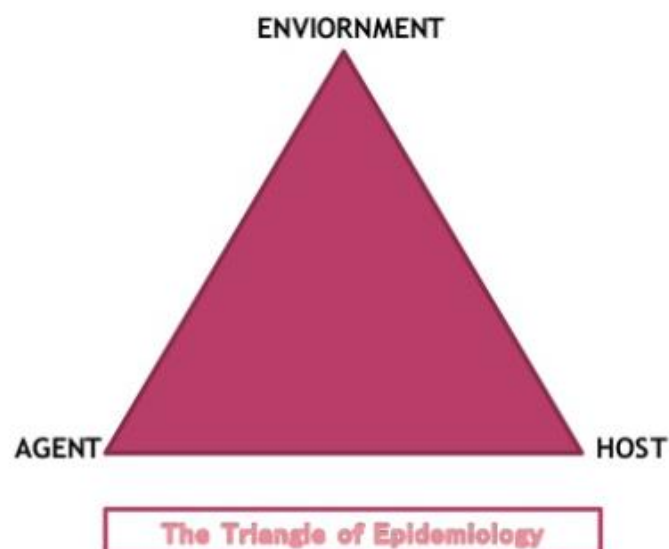


Figure 1. Multifactorial Interactions of a Medical Condition (20)

obese can have foetal macrosomia due to poor diet (economic or socio-cultural conditions). It may also happen that Australian Aboriginal females end up having shoulder dystocia without having diabetes, obesity or poor diet. Some Aboriginal babies experience shoulder dystocia simply because their mothers have a narrower pelvis. Sometimes the anatomical challenges (android pelvis) can interact with pre-existing diabetes (physiology) or low physical activity during pregnancy (socio-cultural) to make the delivery more challenging, increasing chances of shoulder dystocia.

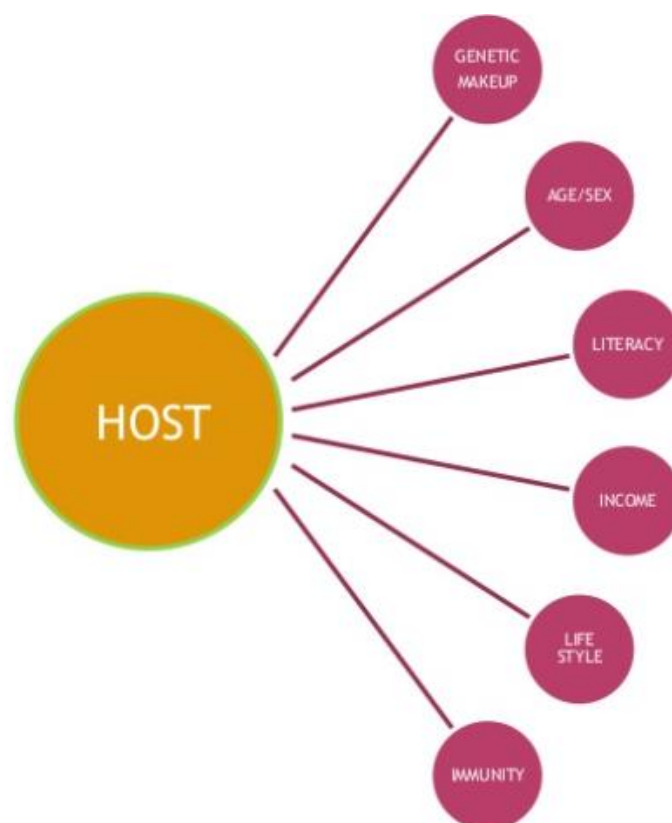


Figure 2. Many Factors Interact to Cause a Condition (20)

However, the good news of multifactorial causation and interaction behind shoulder dystocia is that there can be multiple approaches to preventing the condition (19). Doctors can reduce the risk of shoulder dystocia by controlling diabetes and obesity in the mother, prescribing pelvic exercises, insisting on delivery within the due date, etc.

Preventing Shoulder Dystocia

As shoulder dystocia is highly unpredictable, there is little to nothing a medical practitioner can do to prevent it, except for lowering diabetes, reducing obesity, controlling weight gain during pregnancy and suggesting safe physical activity/exercises (4). But once shoulder

dystocia happens in the labour room, there are practically many strategies that can be adopted to manage the condition.

One of the simplest shoulder dystocia management techniques is to ask the mother to change her position in order to free the shoulder of the baby. About 90% cases are managed by the McRoberts manoeuvre, in which the mother is asked to pull her knees upwards up to her chest as much as possible (7). This position dilates the anteroposterior diameter of the pelvic area (7).

Apart from this, the doctors may apply suprapubic pressure to help free the baby's shoulder from the mother's symphysis pubis (2, 7). Another strategy is to turn the mother over on all fours to allow the baby hang towards gravity and free the shoulder (2). Finally, if these non-invasive strategies do not work, the doctor may also try to manually turn the foetus by inserting his/her hand into the birth canal and use the fingers to rotate the shoulders (2, 15).

In extreme cases of shoulder dystocia, if none of the above techniques works, there are three strategies that doctors adopt – the Zavanelli manoeuvre, the posterior axillary sling traction (PAST) and fracture of the clavicles (15). In the Zavanelli manoeuvre, the foetal head is pushed back into the vagina and then a C-section performed (15). But the ethical consideration in this technique concerns neck trauma in the child; therefore, it is sometimes modified to partially push the baby's head inside and then re-try the vaginal delivery. In the PAST technique, the doctor uses loop-like structures on the baby's posterior axilla and applies traction (15). The third strategy is to fracture one or both the shoulder bones of the baby with finger pressure (15). Although the fractured bones re-join easily afterwards, this is still a destructive approach and generally avoided for ethical considerations (15).

Conclusion

The multifactorial causation and interactions of shoulder dystocia actually make it more prevalent among the Indigenous communities like the Australian Aboriginals. These people not only have genetic predispositions for shoulder dystocia, but also all other physiological, economic and socio-cultural factors that work in various combinations to increase the odds of a shoulder dystocia in their children. The prevalence rate might reduce with more health awareness and access to safe healthcare for the Australian Aboriginals in the future. Further focused research is required to confirm the same.

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