Larry Hinkson[1]
Edward Araujo Júnior[2]
Antonio Fernandes Moron[3]

Ultrasound during the second stage of labour: is it effective to reduce the caesarean section rates?

Ultrassom durante o trabalho de parto: é realmente eficaz para reduzir as taxas de cesarianas?

Editorial

The caesarean section is now the most frequent surgery performed on women at the reproductive age. It is known that caesarean section is associated with risks for the mother and baby, not only in the current pregnancy but also for future pregnancies. Taking into account these consequences and the rising trend of performing caesarean sections globally, strategies and recommendations have been formulated in some countries to decrease the need of a first caesarean section[1].

This kind of surgery in the second stage of labor has been shown to be a contributing factor to the rise of caesarean section rates overall[2]. In the second stage of labor, a vaginal delivery depends on a variety of factors. It is essential the assessment of the relation of the fetal head to structures of the maternal pelvis and the ability to predict a successful outcome, especially when an operative vaginal delivery is contemplated. We know that an ordinary clinical examination is subjective and not accurate; therefore, this subjectivity can lead to an incorrect decision about the mode of delivery. Furthermore, there is a rising trend in caesarean section at full dilatation, which may be due to insecurity on the clinical examination findings and a lack of confidence in achieving a vaginal delivery outcome[3-6].

The use of intrapartum transabdominal and translabial ultrasound has been shown to objectively assess the relationship between the fetal head and maternal pelvis and can indeed predict the likelihood of achieving a vaginal delivery. This fact solves two problems; firstly, it removes the subjectivity from the clinical assessment and secondly, it can improve clinical confidence, especially when an attempt at operative vaginal delivery is wanted.

The fetal head position can firstly be readily assessed transabdominally by locating the fetal spine and the occiput, located at 180° to the spine. Above the symphysis pubis, visualization of the fetal orbits can positively confirm an occiput posterior position. A transverse midline echo of the corpus callosum identifies an occiput transverse position. These basic assessments are crucial in the diagnosis of the overall lie of the fetus and the orientation of the fetal head to the spine. These aspects are important when a rotation element may be required to deliver the baby, which will determine the rotation direction to be performed. Studies have shown that these techniques can be easily taught and applied and may even be more reliable than the clinical exam[7].

Correspondence
Edward Araujo Júnior
Departamento de Obstetrícia, Escola Paulista de Medicina, Universidade Federal de São Paulo
Rua Napoleão de Barros, 875 – Vila Clementino
Zip code: 04024-002
São Paulo (SP), Brazil

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Department of Obstetrics and Gynecology, Charité University Hospital – Berlin, Germany.
[1]Department of Obstetrics and Gynaecology, Charité University Hospital – Berlin, Germany.
[2]Fetal Medicine Discipline, Department of Obstetrics, Escola Paulista de Medicina, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brasil.
[3]Department of Obstetrics, Escola Paulista de Medicina, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brasil.
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Intrapartum translabial ultrasound (ITU) measurements, such as the "Angle of Progression", seems to improve the selection of cases for spontaneous delivery or those that will benefit from operative vaginal delivery and may even select out those patients who may benefit from a caesarean section when the measurements are not favourable. The clinical usefulness of ITU application impacts on the clinical outcomes of patients in the second stage of labour[8,9].

Historically, the use of ultrasound to examine the fetal head station has been investigated since the late 1970s, when Lewin, Sadoul and Beuret[10] showed a relation between the distance from the fetal head to the sacral tip and engagement of the fetal head. There are now several different measurements that have been described to correlate the obtained images with the level of head engagement and clinical outcomes. Dietz and Lanzarone[11] described the "Infra Pubic Line" in order to correlate the fetal head descent, which is the distance between the fetal skull and a perpendicular line to the long axis of the symphysis pubis, passing through its lower edge. Henrich et al.[12] investigated the "Infra Pubic Line" in relation to a perpendicular line through the widest diameter of the fetal head, below the symphysis pubis during uterine contractions and categorised the fetal head descent direction into "Head Down, Head Horizontal or Head-Up". This measurement was used to predict the success of a ventouse delivery. Ghi et al.[13] demonstrated that the movement direction of the fetal head is associated with the fetal head station. The downward movement performs a correlation with the fetal head being at ≤ +1 cm from the ischial spines, with horizontal movements at ≤ +2 cm and with head up movements at ≤ +3 cm.

In an analysis by Kalache et al.[14], the "Angle of Progression" was described by measuring the angle between the long axis of the symphysis pubis and a line running from the inferior apex of the symphysis tangentially to the fetal skull. They showed a significant relationship between an increasing "Angle of Progression" and a successful assisted or spontaneous delivery vaginal delivery at term, with a prolonged second stage of labour. When the angle of progression was more than or equal to 120°, there was a 90% chance of safe delivery, either by vacuum extraction or spontaneously. A study by Bamberg et al.[15] demonstrated that the "Angle of Progression" correlated well with the magnetic resonance imaging (MRI) findings in 31 patients to define the station of the fetal head. Youssef et al.[16,17] described another parameter, the fetal head symphysis distance, which is the distance between the lowest edge of the symphysis pubis and the nearest point of the fetal skull, along a line passing perpendicular to the long axis of the symphysis pubis. Using a three-dimensional (3D) volume analysis in this study with 47 patients, a good correlation with the fetal head station and the "Angle of Progression" with high intra-observer correlation was found.

These measurements result in a more accurate clinical assessment of the second stage, with better outcomes for vaginal delivery and decrease of caesarean section rates. Confidence in performing an operative vaginal delivery can be improved and the methods are easy to teach. The techniques are less invasive and can potentially reduce the risk of ascending infections. With the rapid advancement in the computer software and with ultrasound machines becoming more versatile and easier to apply, this is a promising area for future intensive research.

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