Critical appraisal of the role of applying uterine fundal pressure in labour: First, do no harm

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Aim: Fundal pressure during labour is a frequently used manoeuvre for expediting delivery in cases of fetal distress, dystocia and maternal exhaustion. It is often underreported and therefore challenging to accurately estimate its prevalence. It remains a highly controversial topic, having been abandoned in many countries due to its potentially harmful consequences. Still, some health care professionals consider it safe and effective in life-threatening obstetric emergencies. Our objective was to evaluate the evidence behind the merits and drawbacks of its implementation into clinical practice.

Methods: This is a critical review based on utilising high-quality references on whether it is justifiable to insist on using fundal pressure in contemporary obstetrics.

Results: Fundal pressure is understudied with significant variations worldwide. Reports documenting of any substantial benefit are sparse in the literature. Nevertheless, there is a clear association with various adverse outcomes. An increasing number of experts suggest that fundal pressure should be relinquished.

Conclusions: Unless future randomised controlled trials change our views on traditional methods for shortening labour when needed, practitioners should be extra vigilant in avoiding dubious techniques, as deviation from national guidelines could jeopardise aspirations for optimal intrapartum care. In the time being, fundal pressure should be limited for research purposes only within well-designed studies.

Introduction

Fundal pressure in the second stage of labour is a long-debated approach. It has been widely used in childbirth well prior to the development of obstetric science. Occasionally, it is referred to as Kristeller manoeuvre, after Samuel Kristeller, the obstetrician who first illustrated the assistance of manually pushing the fetus downwards, along with the longitudinal uterine axis, in 1867. Nowadays, fundal pressure is evident in hospital and community settings with variable popularity. In some centres, it is applied routinely, yet it has significantly lost acceptance. In other countries, fundal pressure is regarded as obsolete or even a form of obstetric violence, especially when obtaining informed consent is not a prerequisite. Essentially, fundal pressure intent to accelerate delivery when expulsive efforts are insufficient. Most common indications include suspected fetal compromise, prolonged labour and poor maternal pushing either due to fatigue, coexisting medical conditions or paralysis from dense regional anaesthesia. Notwithstanding that, assorted evaluations have failed to establish any proven clinical benefit from this manoeuvre. Furthermore, it is acknowledged that can be allied with increased frequency of greatly overlooked perinatal complications. Overall, it prevails as one of the most divisive drills in obstetrics.
The fundal pressure technique

The principal consensus behind fundal pressure is to use controlled external force on the uterus. The hypothesis is that delivery is quicker owing to greater efficacy of the underlying contractions and concomitant pushing from the parturient. The precise execution and its timing are not standardised or consistent. Different variations are not always clearly described in the labour summaries. Strengthening the impact of uterine contractions is proposed to take place by massaging the top of the uterus and repeatedly pressing it down in a sharp and short fashion, along with the axis of the birth canal. Whereas many practitioners administer constant pressure on the fundus, others can be more vigorous or use rocking movements. Usually, the assistant uses the hands, one or both fists, and sometimes the elbow. A selection of experimental means has been tested for substituting the physical assistance, including inflatable balloon devices, tightening abdominal binders, belts and sheets. These contraction-enhancing techniques are mainly performed during the active second of labour; however, they have been also used in a continuous manner beginning from early labour and for the duration of it, without apparent time constrictions. It is obvious that the technique depends on the individual clinical scenario and clinician’s preferences on how forcefully, how gradually and when the pressure is applied. The operator is typically a doctor, midwife, doula or nurse.

The modern practice of fundal pressure around the world

The literature reflects the paucity of this unambiguous technique and differences are witnessed even within the same centres. In the United States, fundal pressure used to be particularly favoured, but its use has steeply declined. In 2006, the survey Listening to Mothers II revealed that 17% of parturients had experienced fundal pressure. In the United Kingdom, fundal pressure is not recommended; hence it is not a part of the obstetric interventions and even more, it is considered malpractice. In many mid and eastern European countries, including Germany, Greece, Bulgaria and Italy, fundal pressure is used with different prevalence. Poor reporting makes any exact estimation very difficult to establish. Countries such as Japan, Korea, Brazil, Turkey and India show that fundal pressure has not vanished nor is seen as a last measure in difficult labours, but a fairly popular practice. In some institutions in Egypt, estimated use is up to 24%. A Brazilian study projected the use of fundal pressure in 36.8% of births. A large survey of 1,430 hospitals in Japan found evidence of practising fundal pressure in 89% of these and at least 11% of the deliveries. In Spain, doctors employ fundal pressure up to 70% in protracted labour, and the procedure was applied in a minimum of 26% of births in 2010, despite clear advice against its use from the national guidelines. Finally, in many developing societies, fundal pressure is done largely as a desperate measure since there is no alternative recourse to safe operative delivery.

Theoretical benefits of fundal pressure

The presumed advantages of fundal pressure are that shortens labour via increased expulsive force, improves neonatal outcomes and lessen the need for instrumental deliveries and caesarean sections. Pushing on the mother’s abdomen downwards is believed to promote spontaneous vaginal delivery, which could be more relevant in low-resource settings where options for instrumental or caesarean section are limited. Still, in studies that found modest effects on the length of labour, this was outweighed by a disproportional offset of risks.

Reported pitfalls of fundal pressure

Like any other medical intervention, fundal pressure can be related to some degree of harm. Concerns have been expressed in terms of raised maternal and neonatal morbidity. Immediate or delayed maternal complications include extensive vaginal lacerations, cervical tears, obstetric anal sphincter injuries. In nulliparous women, fundal pressure is associated with more than double the risk of levator ani muscle avulsion. Dyspareunia, increased pelvic pain and de novo stress urinary incontinence have also been described. In addition, there are reports on catastrophic results such as uterine rupture occurring in unscarred uterus and or even maternal deaths secondary to amniotic fluid embolism. Neonatal consequences encompass, but not limited to shoulder dystocia, lower PO2 levels, acute acidosis and lower Apgar scores. Fundal pressure has been unjustifiably used in management of shoulder dystocia with hazardous neonatal effects such as brachial plexus trauma. That is why every major organisation recommends against its use for resolving shoulder dystocia. Special attention should be paid to the fact that all these occurrences might underestimate the true magnitude of the complications, as fundal pressure is recurrently not mentioned in the medical notes or in the literature because of widespread fear of litigation from reporting undesirable outcomes.

The Cochrane review

A Cochrane systematic review in 2017 tried to objectively evaluate the safety and effectiveness of fundal pressure in...
labour. This is the most robust clinical evidence available based on strict selection criteria. The review included all relevant randomised and quasi-randomised controlled trials of fundal pressure versus no fundal pressure in women in second stage. Overall, involved nine trials with a total of 3,948 singleton cephalic presentations. Five trials with 3,057 women conducted in India, Iran, South Africa and Turkey assessing manual fundal pressure in low-risk pregnancies. The rest four research trials with 891 women conducted in Italy, Republic of Korea and the United Kingdom evaluating fundal pressure by means of an inflatable belt. Nevertheless, data from the use of inflatable belts were not taken into consideration for formulating recommendations. Most of the trials had design limitations and high heterogeneity was evident for the majority of outcomes. Manual pressure was applied in four trials, and “gentle assisted pushing” in one with 120 women. Also, two trials recruited only primigravidae. One trial narrowed the fundal pressure to three attempts. The evidence summary concluded that fundal pressure was not linked with improvement in vaginal birth rates within a specified time, instrumental births, caesarean deliveries and duration of the second stage. Neonatal outcomes were not altered either, with no differences on trauma incidents, fractures, haematomas, abnormal arterial cord pH or lower Apgar scores. On the contrary, cervical tears were more frequent with fundal pressure compared with controls. No maternal or neonatal morbidity was reported. The trials did not assess maternal satisfaction; nonetheless, women receiving fundal pressure were more likely to experience postnatal discomfort based on painkiller requirements. Fundal pressure by inflatable belt found to shorten labour in nulliparous, but increased obstetric anal sphincter injuries. The authors concluded that there is no strong evidence for drawing reliable verdict on providing fundal pressure. Finally, proof was lacking in preventing maternal morbidity, post-partum haemorrhage, episiotomy rates, perineal trauma and neonatal safety. There was no evidence to promote fundal pressure routinely or in specific circumstances such as the inability of the mother to actively push in cases of general anaesthesia or unconsciousness. As the manoeuvre is used broadly in areas with limited intrapartum facilities, the authors called for further randomised trials in order to evaluate use in multiparous, describe in detail the optimal technique and assess lingering maternal and infant outcomes.17

**WHO recommendation on fundal pressure to facilitate childbirth**

The World Health Organisation (WHO) formulate global recommendations for improving the providing care standards of the approximately 140 million women who give birth every year. This impactful strategy applies more to the underprivileged populations, where emphasis is given to protect human rights and eliminate any undignified practice both in low- and middle-income countries. The framework for perinatal excellence is refined respectively, once new scientific evidence is identified. WHO is vigilant against any prevailing model of care that could compromise maternal well-being and risk exposure to unwarranted medical interventions that might oppose to the desired woman-centred model on childbirth. In accordance with the above, WHO issued intrapartum guidelines which categorically state that manual fundal pressure during labour is not recommended and this was proposed for immediate implementation. The Guideline Development Group had serious concerns about the risk to mother and newborn from delivery with excessive force by the birth attendants. Likewise, the review advocated that inflatable belts increase anal sphincter damage based on moderate-certainty evidence. The panel expected that the Gentle Assisted Pushing (GAP) trial, could clarify any discrepancies by using an explicit universal protocol.18,19

**The Gentle Assisted Pushing study**

This large multicentre randomised trial was undertaken in South Africa. It evaluated fundal pressure with pregnant woman in an upright posture, compared with upright position alone or routine recumbent posture. The described GAP technique enabled the health care professionals to deliver “steady, firm yet gentle fundal pressure” with the palms of her hands, in the direction of the pelvis, in the long axis of the uterus, taking care to use only strength from the forearms and not from any additional body weight. The women were assisted to assume an upright kneeling or squatting position on the bed. Trained birth attendants kneeled on the bed or stood behind the woman, passed their arms below her axillae and wrapped them around her. Then, placed both open palms, overlapping, on the uterine fundus and were required to maintain pressure for the full duration of the second stage, during the contractions for a maximum of 30 seconds, with at least 30 seconds rest in between applications. The GAP method was distinctively precluded intense pressure, as the relative positions ensured that excessive force cannot be used. All staff involved underwent initial and refresher training in applying GAP, using standardised video demonstrations and simulation. The investigators hoped to establish whether a gentler form of fundal pressure could improve the mean time from randomisation to birth. All participants were low-risk nulliparous women. Exclusion criteria were multiple pregnancies, non-cephalic presentations and when vaginal birth was contraindicated. From the total of 1,158 participants,
388 were allocated to GAP, 386 to upright position and 384 to routine practice. Baseline characteristics were comparable. In the experimental arm, GAP had applied a median of two times. Women in upright position alone spent a median of 6 min upright. Mean duration of birth was similar across groups. There were no differences in secondary outcomes, except that at two sites maternal discomfort was greater for both GAP and upright position compared with controls. As no benefit was identified from GAP supported upright position, the authors urged limiting the technique into clinical trials only. In the absence of statistical significance, women should be allowed to embrace any preferable position. The study was not large enough to address rarer safety outcomes.\(^{20}\)

**Discussion**

Competent birth attendants should aspire for excellent intrapartum care, ensuring safe maternal and neonatal safety. Whenever certain clinical scenarios necessitate medical input, this should be underpinned with scientific knowledge. Metanalysis of few relevant randomised controlled trials has concluded that for shortening the second stage of labour, regrettably, the fundal pressure does not seem to be supported by evidence. Therefore, it seems prudent for individuals to comply with the transparent comprehensive recommendations and avoid using a technique which has few benefits and potentially increase fetomaternal perils. Clinical decision-making can only rely on familiar and thoroughly scrutinised practices. Fundal pressure could be facilitated in well-controlled research projects with detailed protocols, ethical approval and informed consent from all participants. In spite of that, some professionals still insist on clearer indications and better training instead of abandoning the technique. This appeal can be a risky step forward, as fundal pressure does not fit specific safety criteria, even when it is delivered consistently. Allowing questionable practices can lead to increased adverse incidents since less experienced operators would enforce these outside validated guidelines to women residing in rural areas with lower medical coverage. When fetal wellbeing is compromised, prompt escalation to higher level of care and well-studied alternatives as instrumental delivery or emergency caesarean section should be considered by skilled professionals.

Moreover, in developed countries, fundal pressure has not been successfully incorporated in intrapartum policies and in training curriculums. Instead, revised protocols based on WHO recommendations should be adopted. Preventing the need for fundal pressure could be achieved by mobilising the mother in labour, endorsing a more upright position, ensuring continuous intrapartum support, manually correction fetal malposition, avoidance of routine epidurals and delayed active second stage.\(^{21}\) Differing from these appears irrational and would be unreasonable to be offered to parurients. If resistance ensues in the process of amending fixed behaviours, doctors should concentrate on utilising resources for better teaching, superior monitoring in labour and establishing referring pathways when indicated. All stakeholders are required to adapt to the current proposals, encourage a smooth transition and adhere to these.

**Conclusions**

In the evidence-based era of modern obstetrics, fundal pressure seems an anachronism. It was proposed as a last resort technique when operative delivery options were non-existent. It is problematic to insist in this practice both in view of significant medico-legal implications as well as ethical grounds. At present, the utility of fundal pressure is limited, and extra caution should be exercised if clinical settings defend its use against overwhelming international recommendations. Birth attendants should bear in mind that it can be difficult to quantify with any degree of precision the exact extent of the directly related risks. We can confidently state that fundal pressure, to date, is proved to be ineffective and may be unsafe. In light of that, practitioners who ignore these unequivocal guidelines might benefit from obtaining informed consent prior to the procedure, documenting the events meticulously and considering performing postpartum pelvic floor assessment in women who underwent fundal pressure. Without these precautions, they could be accountable for violating basic human rights, wasting costly resources and creating significant barriers to the women-centred model of care. The prevailing, intrapartum guidance consolidates our aims for healthy women and babies based on established clinical practices that support a positive experience, sustain safety and empower women’s expectations and equity. Although the use of fundal pressure has decreased, greater awareness is required. Our understanding of childbirth has improved considerably, and it is time for that to manifest in our obstetric mindset.

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There is no disclosure of interest to declare.

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