



Training for breech deliveries with the mother in an upright position: An innovative adaptation of a simulation model

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ARTICLE INFO

Keywords:

Breech
Simulation
All fours
Upright position

ABSTRACT

Background: Delivery of a breech baby with the mother in an upright position or on all fours has gained a renewed interest. In these positions, the obstetrician or midwife needs to learn new landmarks and maneuvers. A realistic simulation model would be a valuable adjunct for breech on all fours teaching programs.

Material and methods: This article describes the simulation model and training program we have developed to train an interprofessional team to assist breech births when the mother is on all fours. A questionnaire was used to evaluate the realism of the adapted mannequin and the impact of training on the confidence level of the participants.

Results: On a Likert scale of 1 to 5, 92% of participants agreed or strongly agreed that the adapted mannequin used was realistic for training obstetric maneuvers for complicated breech births. After training, their confidence level supporting a breech birth in an upright position rose from an average of 2.5 to 5.7 on a scale of 1 to 10.

Conclusion: Learning the skills for breech deliveries on all fours is made possible by targeted training with this adapted simulation model.

Introduction

International guidelines on breech births have been revised in the past few years and now consider vaginal breech birth a possible option for most women [1–5]. For 50 years, obstetrical research on breech birth has concentrated its efforts on comparing maternal and neonatal outcomes according to the delivery route [6–8]. The need to optimize and teach vaginal breech birth from a more physiological point of view might have been overlooked.

There is growing evidence that maternal upright position improves obstetrical outcomes [9,10]. For breech deliveries, it is an interesting alternative to the supine position and is increasingly used in clinical practice [11,12]. It has been reported to decrease the duration of the

second stage of labor, the need for maneuvers, maternal and neonatal injuries and the cesarean section (CS) rate [13,14]. When delivery is attempted in the maternal upright position the birth attendant has a more direct access to the fetus, which is higher on its body than when the mother is on her back. However, additional skills need to be learned for when the baby needs help to be born. Unfortunately, there are two obstacles to the dissemination of this technique and its evaluation. Firstly, practitioners experienced in vaginal breech deliveries are becoming increasingly rare. This is a major obstacle for the reintroduction of vaginal breech births in obstetrical practice. A breech clinic with continuity of expert care 24 h a day has been described as an option to overcome this barrier to facilitating vaginal breech births [12]. Secondly, there is no commercialized simulation mannequin to train for this

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¹ For the Prise en charge des Accouchements à Risque eT des Urgences Maternelles (PARTUM) teaching programme.

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type of delivery. As shown by Crofts et al. for shoulder dystocia, or Cornette et al. and Desseauve et al. recently for the second twin extraction, simulation and customization of available equipment offers valuable training opportunities [15–17]. Numerous pelvic models are available to practice breech extraction maneuvers in the supine position but none have been described for the upright position.

In this article, we present and evaluate the model we have developed to simulate a breech delivery on all fours and propose how to incorporate this upright breech training into the *Prise en charge des Accouchements à Risque eT des Urgences Maternelles (PARTUM)* European training program [18].

Materials and methods

Thirteen healthcare professionals were trained in optimum care for vaginal breech birth in the upright position using a mannequin for simulation purposes. The mannequin chosen was the Sophie's Mum Birth Simulator Version 4.0 (MODEL-med, Clinical Innovation pty, ltd) which provides a realistic training experience due to its soft latex design surrounding a bony pelvis. The Sophie's Mum Birth Simulator was initially designed to be used in lithotomy, therefore a metal structure was designed and built in order to permit the simulation of an upright birth position (Fig. 1 and Appendix A (video)). The structure was built with welded steel bars customized to the mannequin size (Fig. 1). The dummy is held to the structure by four screws through the existing rigid plastic support. The plastic support constitutes a hard plane which allows the flexion and rotation of the fetal mobile. The whole device is secured to a table by four clamps. The fetus component of the simulator is also manufactured by MODEL-Med, Clinical Innovation pty, ltd. It comprises of soft latex covering a realistic skeleton structure. Its articulations make it possible to simulate the various types of podalic presentation (frank, complete or incomplete breech) as well as raised/nuchal arms (demonstrated in part 2 of the video). The head can also be deflected during birth. The fetus and pelvis should be well lubricated with oil before use.

Our breech birth training session covered theoretical and practical

elements based on up-to-date scientific evidence and was provided as follows. Initially, all of the maneuvers that may be necessary to assist a fetus during a breech birth in an upright position were comprehensively explained using the algorithm devised by Reitter et al. [11] as a guide. Videos of breech deliveries were shown to help participants to visualize the maneuvers. An instructor then introduced the model and gave instructions for the simulation. The instructor demonstrated the maneuvers in four different steps with the aid of an assistant who pushed the fetal model into the pelvis. Firstly the demonstration was undertaken at real speed, then the same maneuvers were shown accompanied with detailed explanations. Following this the participants were invited to provide the explanations during the simulation, and finally, the simulation was undertaken by the participants. Comments and constructive feedback were given from the instructor.

At the end of the training, a questionnaire was distributed to the trainees. The questionnaire used was adapted from Post et al [19] and included questions about the mannequin used and the “on all fours” delivery position (Appendix B). It was translated into French.

Results

All of the 13 participants completed the questionnaire. Of these 69 % ($n = 9$) were physicians and 31 % ($n = 4$) were midwives. The numbers of years of training after medical school ranged from four to 19 years with an average of eight years. A total of 54 % ($n = 7$) of the participants had already received training on breech birth in the supine position.

All participants had previously attended a vaginal breech delivery, however 69 % had only seen between 1 and 3 cases. All participants felt that their training was insufficient to manage a breech birth. The vast majority (92 %) thought that annual training was necessary, five thought that some obstetricians should be subspecialised, and three thought that breech babies should be referred to specific centers. More than half of participants (62 %) had never heard of the possibility of delivering a breech baby with the mother on all fours but at the end of the training, all of them thought that it was a potentially useful position.

On a Likert scale of 1 to 5, 92 % of the participants agreed or strongly

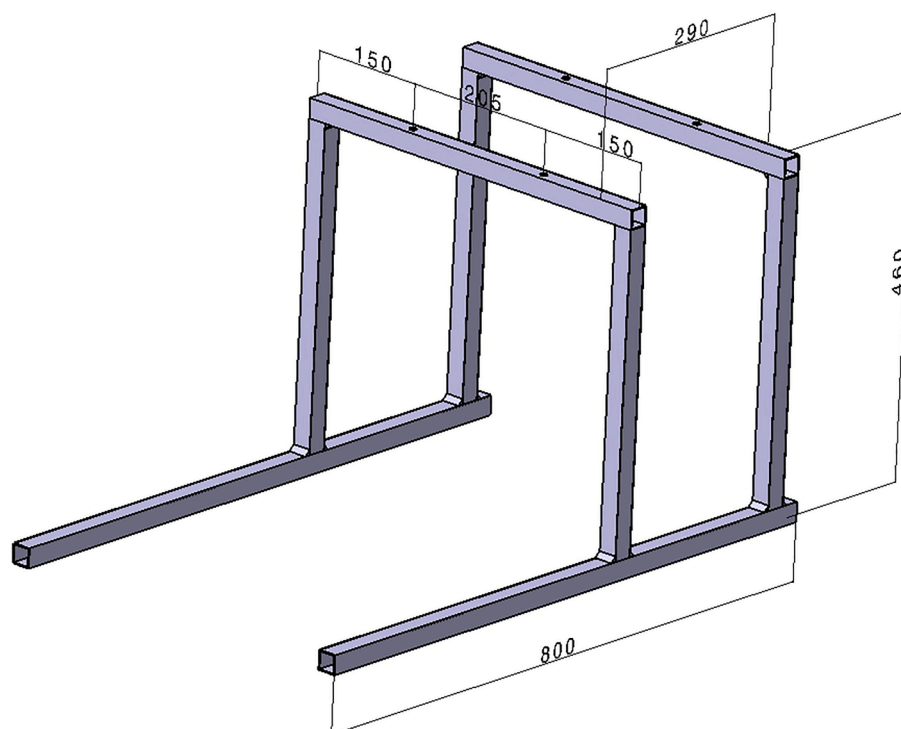


Fig. 1. Description of the metallic structure built to support the model. Measurements are given in millimeters.

agreed that the mannequin model used was realistic for training technical skills.

On a scale of 1 to 10, participants were asked how confident they felt supporting a breech birth on all fours. The average score before training was 2.5 (minimum 1, maximum 5). After training, the score rose to 5.7 (minimum 3, maximum 9). The same question was asked for the situation of an unexpected breech delivery. The baseline score was 3.3 (minimum 1, maximum 7). After training the average score was 6 (minimum 2, maximum 8). To further assess confidence the participants were asked the question “would you ask a patient who is pushing on all fours to lie on her back for the birth?”, to this 62 % of participants reported they disagreed or strongly disagreed.

There was no improvement suggestion for the model, as all participants considered it satisfactory. Regarding the improvement of training, all comments emphasized the importance of recurrent sessions.

Discussion

This 4-hour simulation program was tested in a maternity hospital in Switzerland in order to evaluate its effectiveness before introduction into the PARTUM training curriculum. The proposed training allows healthcare professionals to better understand the obstetrical mechanics during the descent of the fetal model. It is relatively unusual for obstetricians to perform deliveries on all fours but they usually master the breech maneuvers with the patient in a dorsal position as these are also performed during cesarean births. Midwives tend to be more accustomed to assisting mothers in upright positions.

Being able to simulate breech births on all fours within an inter-professional team allows caregivers to benefit from the knowledge of others and creates a climate conducive to learning. In turn, this learning helps to reduce the apprehension that may be present during a vaginal breech birth, particularly when it is unexpected.

The 4-hour training session provided appears to have increased the confidence of participants for this type of birth, demonstrated by the increase in scores denoting how confident they felt when delivering known and unexpected breech babies. Notably, the mean scores were higher for emergency breech deliveries both before and after the training, suggesting that caregivers may try more frequently to avoid a c-section when the woman presents in advanced labour.

Since this initial test, the mannequin has been used for the department's monthly training sessions and will be used for the yearly PARTUM training. This will provide further opportunity for evaluation of the mannequin during these events. As teaching of breech delivery on all fours will be implemented following our development of this adapted simulation model, we now aim to study the potential impact on management of breech deliveries in trained teams.

In addition to our breech birth training, the participants were also able to practice cephalic delivery on all fours. Using this simulation model could spark interest about new techniques for fetal extraction with the mother in an upright position.

Conclusion

Implementation of training of obstetric maneuvers in case of an upright position of the mother is important to facilitate maternal choice and wishes during delivery. It will also enable us to further study the potential benefits of this birth position specifically for breech babies. The simulation model we propose allows caregivers to train as often as necessary in a risk free manner, in order to master the maneuvers that may be required in complicated breech birth with the mother in an upright position.

Conflict of interest

None declared.

Author contributions

AF, PFC, DD and CD have conceived and designed the work, LT provided technical expertise, SD provided important intellectual content, AF and CD drafted the article. All authors critically reviewed the manuscript and approved the final version.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We thank Holly Clarke for her help preparing the manuscript and Harold Smits for his video commentary.

Consent

Not applicable.

Funding

The PARTUM teaching program has been partially supported by the European Commission through Erasmus +: POEM-SET (2021-FR01-KA220-HED-000032171).

Ethical approval

Not applicable.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ejogrb.2022.11.015>.

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