

The Birth of F. Birthing Chair

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ABSTRACT

This paper describes and discusses the birth of a device. The invention pertains to birthing device, specifically to obstetric. The invention was born out of personal reflection and continual aspiration. The chair is intended to be used in labor and birth to promote the comfort and facilitate natural birthing process whilst reducing or bringing unnecessary interference to minimum. 'F. Birthing Chair' is designed with the aim allowing birthing women to be in an upright position. The position makes maximum use of force of gravity.

Keywords: Invention, Birthing, Upright

INTRODUCTION

Over many years, the supine position has been commonly used as standard medical practice by birth attendants. This position seems to have been adopted without consideration of the physiological consequences for either the woman or her baby. The literature indicates that there are different and more efficient positions women can use for labor and birth. Horizontal and vertical positions are mostly used. The horizontal position is where there is an angle of less than 45° between the horizontal and the birth canal and the vertical at the same angle is greater than 45°. Vertical birthing positions are classified as upright positions such as squatting, sitting, standing, kneeling and kneeling on all fours [1,2]. In contrast, horizontal positions are recumbent and semi-recumbent or the full supine lithotomy position [2,3]. Before the 19th century, the upright birthing position was common in many Western as well as in developing countries. Supine position used for birth followed the introduction of obstetric interventions such as forceps deliveries and continuous fetal monitoring in modern obstetric care.

Nonetheless, positioning of women at the time of birth is potentially an important clinical factor. Being upright and mobile during labor provides a right angle for the fetus with the aid of gravity to propel rotation and descent of the fetal head onto the pelvis. The weight of the fetal head on the cervix assists in the final cervical dilatation that successfully completes the first stage of labor. Upright position have a number of physiological advantages, such as shortening of second stage, no compression on the major vessels, no maternal hypotension, no reduction in the placenta blood flow and fetal pH [4-6]. Upright positions enable gravity to assist mothers' efforts during labor and birth and assist a

baby to descend through the birth canal [2]. A squatting position produces an increase in the anterior-posterior and transverse pelvic outlet, thus helping the descent of the presenting part [7]. Kneeling on all fours helps a woman to feel more comfortable, cope better with labor pains and in control of her birth; it also helps to reduce the risk of perineal injury [2,8]. Furthermore, some studies highlight that women who give birth in the upright position experience less pain and are less vulnerable to incurring episiotomy and perineal trauma [9,10]. Other benefits reported by a number of studies include fetal oxygenation, shorter second stage, and decreased risk of needing an assisted birth, improved strength and frequency of uterine contractions [5,11,12]. Upright and lateral position for birth is also reported to be associated with greater maternal comfort and less perineal injury [2,13,14].

There is also significantly emerging evidence that birthing position has a potential influence on perineal outcomes [2,15,16]. The use of upright positions for birth could bring about a reduction in the risk of perineal trauma from either spontaneous tears or the use of episiotomy. A study compared maternal semi-sitting position with lateral, squatting, standing and hands and knee positions during the expulsive phase of second stage of labor and found that semi

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-sitting represented a greater risk for 2nd degree tears and the performance of an episiotomy [16]. Researchers conducted a study to identify maternal, new born and obstetric factors associated with birth related injuries, the study reported that position at the time of birth had the greatest influence on perineal outcome. The study also reported that the use of episiotomy was high in recumbent position. This suggests that the effect of position on perineal outcome is significant.

Most women in human societies progress through labor lying in bed for the entire period of labor and birth. However, evidence suggests the bed is no place for labor, but often that is all there is in the hospital setting [17]. All women, in both developed and developing countries, when encouraged will choose upright positions and change to different positions at will to find a comfortable one [5,18]. Current evidence on the benefits of assuming alternative positions in labor is widely available and accessible [5,7]. Yet, women continue to give birth in the horizontal position. Upright positions enable gravity to assist mothers' efforts during labor and birth and assist a baby to descend through the birth canal [2]. A squatting position produces an increase in the anterior-posterior and transverse pelvic outlet, thus helping the descent of the presenting part [7]. Kneeling on all fours helps a woman to feel more comfortable, cope better with labor pains and in control of her birth; it also helps to reduce the risk of perineal injury [7].

In contrast, lithotomy position or lying on the back with hips and knees flexed thighs apart and sometimes legs up in stirrups. This position promotes loss of control, and actually pushes the baby uphill while narrowing the pelvis. The lithotomy position consequently increases vulnerability in women to spontaneous tears and raises the risk of episiotomies [19]. It can also result in the damage of lower extremity nerves [20]. In the lying down position the angle of the sacrum tilts forward and the pelvic outlet is reduced.

The supine position is also associated with compression of the large vessels by the pregnant uterus. This reduces fetal nutrition and oxygenation during labor and contributes to hypotension and hemorrhage in the mother. Vessels compressed in the lying down position includes the abdominal vessels, descending aorta and inferior vena-cava which affect the well-being of mother and fetus. The weight of the fetus compresses the vena-cava lowering maternal blood pressure and reducing placental blood flow, resulting in a lowered fetal pH. A study conducted a randomized experimental study between an upright position (sitting) and the supine-lithotomy position involving 200 low risk

primigravidae [21]. The results showed reduced pain, shorter second and third stages of labor, average Apgar scores of 8.7 and 9.9 in 1 and 5 min, respectively, and maintained baseline blood pressure, in favor of the upright position (sitting). These study findings are similar to other studies [22], despite the risks associated with the lithotomy position; it is evidently accepted as standard practice for vaginal birth in many African countries.

However, while women may not necessarily prefer the lithotomy position for birth they are offered limited choices. Studies reporting evidence from randomized controlled trials on the benefits of one birthing position over another indicated that most women preferred upright birthing positions.

Despite the robust evidence in support of the use of upright position in childbirth, Most developing countries, continues to use birthing position and perineal care that are not based on current best evidence and little is known as to why it is the case. Therefore, my focus of interest is in raising the profile of midwifery care, maternal health and wellbeing and maintaining evidence based care that would offer women a better childbirth experience. This is the factor that led to the invention of a birthing chair to facilitate birth in upright position, which when in circulation will support women to birth in varying upright positions. The chair has been recognized and licensed by the Nigerian Copyright Commission and is currently undergoing patent registration.

DESCRIPTION OF THE INVENTION (F. BIRTHING CHAIR)

The invention relates to birthing chairs made of rigid non-porous thick plastic and steel coated materials. The purpose of the plastic and steel material is to protect the chair from blood and excrement during the delivery. This is required for adequate cleansing and disinfection after each use to prevent nosocomial infection.

The chair contains backrest and seat portion with indented front (**Figure 1**). The back rest and the seat area are ergonomically grooved for a comfortable seated position and to provide minimal contact and support to the ischial tuberosities. These supports allows for optimal positioning of the pelvis. The backrest ensures that the back of the woman giving birth stays in upright. The seat portion is circular with a half-moon shaped intention to allow increase in perineal opening, good view and adequate access to the perineum when being used.



Figure 1. Diagrammatic view of F. birthing chair.

The chair has series of broad reinforcement structures particularly at the back and under the seat portion. The structural bars and centrally positioned steel iron support Pillar with four legs are connected in a way that allows the chair to sit on the ground surface with great stability. Each of the support contributes to the structural strength, integrity and stability of the device. This is essential in order to allow for certain positions in which the laboring woman is exerting pressure at a varying angles on the chair for support.

Due to differences in height as well as individual preferences for the angle of the legs, pelvis and back in a seated or squatted position during labor and birth, no single height can be ideal for all. The invention has an adjustable mechanism which facilitates a seated or squatted position at varying height to accommodate the differences in ergonomic needs of individual woman. This mechanism ensures that the chair can be moved up and down for the desired height.

Handles and belts with twisted cord at both sides' forms areas of gripping providing the woman extra leverage during labor. The grips are constructed as separate piece and are integrated into a single part design. Properly manufactured, the chair is constructed with no mechanical joining of the handles and grips in order to avoid the creation of gaps and crevices in which the bodily fluids arising from giving birth might become trapped, thereby creating a risk of cross infection between users.

Generally, the invention is stable enough to allow certain amount of flexibility, have several points for gripping, making the chair more suitable in supporting birthing process as nature intended.

The invention is not limited to the description of the device, other changes and modifications may be made within the scope of the claims.

CONCLUSION

The invention of F. Birthing Chair represents the first step towards evidenced based practice in the area of birthing position and perineal care during childbirth in some of the developing countries.

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