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Original Research Article

Effects of modified Elkin's procedure along with specific breech exercises in breech repositioning and to determine the feasibility of normal delivery: an experimental study

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ABSTRACT

Background: Breech presentation is observed in 3-4% of pregnancies at term and is one of the leading causes of caesarean section. Babies with breech presentation are at increased risk of complications during birth. An experimental study was conducted to demonstrate the effects of the Modified Elkin's procedure and specific breech exercises. However, there is a lack of evidence suggesting which technique is superior in reducing the risk associated with vaginal delivery in breech presentation.
Methods: This experimental study enrolled 123 subjects diagnosed with breech presentation by ultrasonography during the third trimester. Participants in the experimental group were instructed to perform the Modified Elkin's procedure along with specific breech exercises. These interventions were designed to be safe and simple and were found to significantly aid in breech repositioning, thereby increasing the feasibility of normal delivery. The study duration was 8 months. Treatment consisted of three sessions per week on alternate days for 4 weeks, including rest periods. Exercises were advised for women with fetuses in breech presentation.
Results: The results of the study showed a marked difference between the pre- and post-test values. After completing the full set of exercise sessions, there was a significant improvement in breech repositioning and an increased likelihood of normal delivery.
Conclusions: This trial revealed that 4 weeks of treatment using the Modified Elkin's procedure along with specific breech exercises is effective for breech repositioning. Based on the results, this technique appears to be a simple, less painful, and safe option for managing breech presentation in the third trimester of pregnancy. It may also influence the mode of delivery.

Keywords: Breech, Knee-chest position, SDA, NP score, Normal delivery

INTRODUCTION

Reproduction is a vital biological function essential for the continuation of life across all species, whether simple or complex, plant or animal.[1] Nature has evolved mechanisms to support childbirth in a manner that minimizes harm to both the mother and the infant. This is typically seen in normal deliveries, where the baby presents head-first, followed by the rest of the body. However, breech presentation- where the fetus's pelvis or feet are positioned to emerge first- is the most frequently observed malpresentation.[1] It occurs when the fetus is in a longitudinal position with the buttocks or feet at the pelvic opening and the head at the top of the uterus.[2] Breech presentations are categorized into three types: complete, frank, and footling. While breech position is common

before 30 weeks of gestation, it becomes a clinical concern if it persists beyond 32-34 weeks. Research supports implementing early interventions during this period to promote a cephalic presentation. Breech presentation remains a common obstetric challenge, often resulting in cesarean deliveries and affecting 2% to 4% of full-term pregnancies.[1,2] Statistically, 3% to 4% of fetuses remain in breech at term. Around 7% present breech at 32 weeks and up to 25% do so at 28 weeks or earlier. After one breech birth, the likelihood of recurrence is approximately 10% in the next pregnancy and rises to 27% by the third.[2] Deliveries involving breech presentation are considered high-risk due to increased maternal and neonatal complications. Several studies report greater risks of morbidity and mortality in vaginal breech deliveries.[3,4] To minimize adverse outcomes, comprehensive obstetric and neonatal support is crucial. Several factors may predispose to breech positioning, including prematurity, multiple pregnancies, hydrocephalus, low amniotic fluid (oligohydramnios), abnormal placental positioning (placenta previa or polar placentation), gestational diabetes, previous breech births, short umbilical cord, low birth weight, uterine abnormalities, congenital anomalies, and a history of cesarean sections.[5]

Ultrasound imaging plays a key role in evaluating fetal orientation during pregnancy and labor. It can help determine the baby's position, presentation, and descent, including the use of the suprapubic descent angle (SDA) for cephalic assessment.[6] The International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) advocates ultrasound use during prolonged or arrested labor when abnormal fetal positions are suspected, and prior to operative vaginal deliveries.[6,7] When breech presentation is persistent or recurrent, the decision to proceed with vaginal delivery is often guided by the Newman–Peacock Score (NPS), which evaluates five parameters: parity, cervical dilation, estimated fetal weight, placental location, and fetal station.[8] According to Newman et al., favorable factors for successful vaginal delivery include being multiparous, lack of cervical dilation, fetal macrosomia, non-lower placental placement, and a fetal station of ≤-3 are aspects that contribute to a higher score and, therefore, a likely successful procedure.[8,9] Although breech births carry inherent risks, especially with vaginal delivery, a planned cesarean section can help mitigate many of these complications. The chances of breech presentation persisting at the time of delivery and the risk of Caesarean section can be reduced by Modified Elkin's procedure (Knee-chest position). The Modified Elkin's procedure is an alternative exercise technique to repositioning the fetus to cephalic presentation.[10]

METHODS

This trial was designed as an open-label experimental study. The study was conducted at Sri Ramakrishna Multispecialty Hospital, Coimbatore, and an academic medical center. The study period is from September 2022 to February 2024. The protocol was designed in accordance with SPIRIT (Standard protocol items: recommendations for interventional trials) guidelines. The Suprapubic descent angle is calculated by paired t test calculator and the Newman Peacock Score is calculated by one sample t test calculator.

$$t_{calc} = \frac{d}{\frac{S_d}{\sqrt{n}}}$$

$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$$

Inclusion criteria

Participants met the following criteria were included women aged between 20 and 35 years, both primi and multiparous women, diagnosed with complete or frank breech presentation, BMI≤30 kg/m² and the breech presentation confirmed by ultrasound (growth scan).

Exclusion criteria

The exclusion criteria were of three factors like, maternal factors, fetal factors, placental and amniotic fluid factors (a) maternal factors those with uterine abnormalities (e.g., bicornuate, septate uterus), History of previous uterine surgeries, footling breech presentation, contracted pelvis, multiple pregnancy, history of antepartum hemorrhage, elderly primigravida (≥30 years) and formal indication for caesarean section (e.g., HIV, STDs); (b) fetal factors: prematurity, fetal anomalies (e.g., anencephaly, hydrocephalus), twin pregnancy and history of intrauterine fetal death; and (c) placental and amniotic fluid factors: placental abnormalities, oligohydramnios (AFI<5 cm), polyhydramnios (AFI>25 cm) and nuchal cord or short umbilical cord.

Participant enrollment

Recruitment was conducted at a single academic hospital. Informed consent was obtained from all participants before inclusion in the study. Eligible participants were pregnant women in their third trimester (from 32 weeks) with a singleton breech presentation. A transabdominal obstetric ultrasound examination using a 3.5 MHz probe was performed free of charge to confirm the breech presentation. The study was conducted over a period of 1year and 6 months. A total of 123 pregnant women aged between 20 and 35 years who met the inclusion and exclusion criteria were enrolled. Treatment sessions were administered for 45 minutes per day, including rest periods, and scheduled three times per week on alternate days, for a total duration of 4 weeks.

The effect size (d) was calculated using the formula: effect size (d)=Mean change score/standard deviation of pre-intervention score, where the mean change score is the

difference between the mean values of the pre- and post-intervention scores.

Data analysis

Data analysis is a method by which the validity of a research study is evaluated and is essential for constructing the validity of a research study purpose. It requires a number of closely related operations beginning from the establishment of a category to raw data through coding, drawing statistical inferences and also finally tabulation of the data that have been collected.

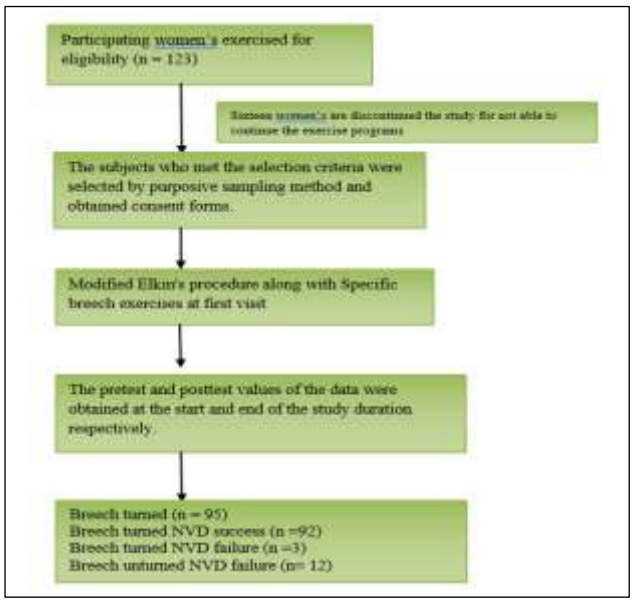

Figure 1: Study design and findings.

Data collected was statistically analyzed. Paired 't' test and one sample 't' test were used to find out the statistical differences. Pre and post-test values of the data were obtained on the first day of treatment and at the end of four weeks. The 'p' value was set at <0.05. Corresponding formulas for paired 't' test and one sample 't' test were used.

RESULTS

The data gathered from 107 pregnant women with breech presentation for 4 weeks of treatment was tabulated, analyzed and interpreted. The pre-test and post-test values of the data were obtained at the start and end of study duration respectively. Mean value was used to find out whether there is any significant difference between pre-test and past-test values.

Table 1 shows the analysis of the measured pre-test mean value of supra pubic descent angle (SDA) 81.22 was found to be comparatively greater than the post-test means value of SDA 33.62 for 80 degrees of freedom at 0.05 level of significance, the table 't' value was 1.990, and the calculated 't' value of SDA was 29.0107 which was obtained by using a paired 't' test. Since the calculated 't' value was higher than the table't' value, it shows a highly significant difference between the pre and post-test values.

Table 3 measured posts mean value of Newman peacock score was 5.25. The calculated standard deviation and 't' value was 1.618 and 11.56 respectively at 80 degrees of freedom and at 0.05 level of significant. This result clearly shows that the calculated 't' value is greater than the table 't' value. This indicates that women improved more obviously to go for normal vaginal delivery after repositioning. These results obtained in the present study shows that, the breech repositioning exercises achieved significant superior results.

Table 1: Suprapubic descent angle.

S. no.	Test	Mean	Mean difference	SD	Calculated 't' value	Table 't' value	P value
1.	Pre test	81.22	47.6	6.94	29.0107	1.990	**<0.05**
2.	Post test	33.62		14.24			

Table 2: Newman peacock score- descriptive data of the predictors for the successful and unsuccessful NVD mothers

Parameters	Total sample	NVD success	NVD failure
Gestational age (weeks)			
32-33	22	20	2
34-36	65	61	4
36-38	20	11	9
BMI			
Under weight	11	7	4
Normal weight	60	54	6
Over weight	36	31	5
Placental position			
Anterior	30	20	10
Posterior	30	27	3
Fundal/lateral	47	45	2

Continued.

Parameters	Total sample	NVD success	NVD failure
Parity			
Primi	70	67	3
Para 1	22	18	4
Para 2	15	7	8
Type of breech			
Complete	83	76	7
Incomplete	24	16	8

Table 3: Post-test one sample 't' test for NP score.

S. no.	NP score	Mean	SD	Calculated 't' value	Table 't' value	P value
1.	**Post test**	5.25	1.618	11.56	1.664	**<0.05**

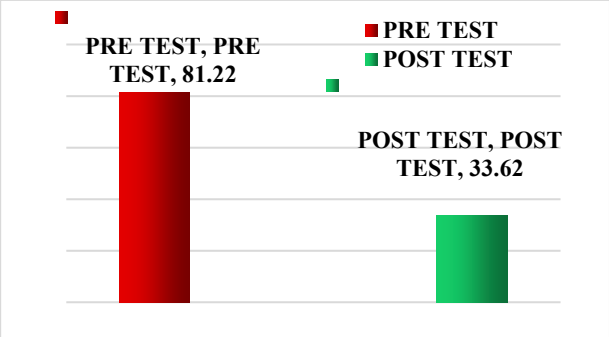

Figure 2: Pre-test and post-test for SDA.

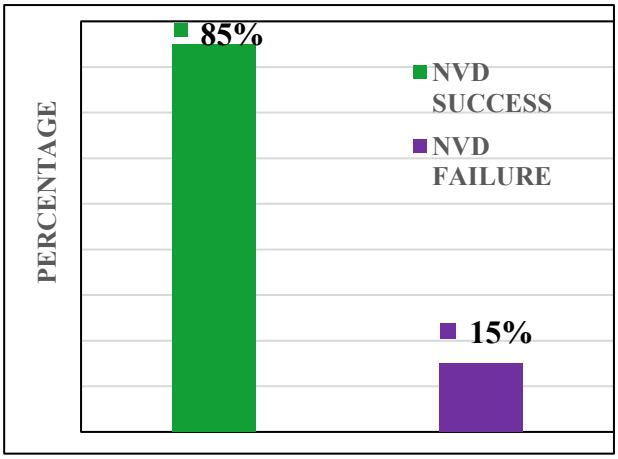

Figure 3: NP score success and failure rate.

DISCUSSION

Breech position is a fairly common presentation in pregnancy, occurring in about 3-4% of full-term cases. At 32 weeks of gestation, roughly 7% of babies are in breech, and before 28 weeks, the rate can be as high as 25%.

In this study, the used two tools- SDA and the Newman-peacock score (NPS)- to assess fetal position and chances of vaginal delivery.

Out of 123 pregnant women initially enrolled, 107 met the required criteria and continued with the study. Sixteen participants dropped out for different reasons. Those included in the trial were taught to perform a combination of Modified Elkin's position and specific breech-related exercises.[10] These were done three times a week, each session lasting 45 minutes with rest intervals, for four weeks. After each demonstration, participants practiced under supervision in the outpatient department. This approach was successful in turning many babies from breech to a head-down position.[11]

Modified Elkin's method is considered a safe technique for encouraging breech babies to rotate into the cephalic position. It has been tested in other studies with positive results and is often advised for such cases.[11]

Ultrasound was used throughout the pregnancy to monitor fetal lie, position, and descent. The results suggested that women with NPS scores between 5 and 7, or 8 and above were more likely to have a successful repositioning. Among the participants who responded positively to the intervention, around 86% (92 out of 107) went on to have a normal vaginal delivery. This supports the use of these exercises to reduce the need for cesarean section or risky vaginal breech deliveries.

The high success rate may be partly due to the timing of the intervention, which targeted women between 32 and 36 weeks of pregnancy- a period when spontaneous turning is still likely. The data also showed that breech correction was more successful when the placenta was located laterally or at the top (fundus) of the uterus. Posterior placental positioning had better outcomes than anterior placement.

Interestingly, the success rate did not vary with maternal weight. Women of all BMI categories- underweight, normal, and overweight- had similar chances of vaginal delivery. Other studies have described the posture used: the mother kneels with her thighs upright and torso parallel to the ground, resting on her hands. This position helps the uterus shift upward due to gravity, making more space for the baby to turn. It allows the uterus to take on a more oval shape, which supports fetal rotation.

Limitations

Limitations of this study are short-term follow ups, single group study, singleton breech presentation. The exercise program done at home could not supervised directly, but through online media with the help of participant's caregivers.

CONCLUSION

In conclusion, this study shows that the combination of Modified Elkin's technique and specific breech exercises can successfully help turn the baby into a cephalic position in a high percentage of cases. It also increases the chances of a safe, normal delivery without surgical intervention. This Experimental Study revealed that after 4 weeks of treatment, by advising women with fetus in breech presentation could use Modified Elkin's procedure along with specificbreech exercises to be safe and simple which has significantly helps in breech repositioning there by increasing the feasibility of normal delivery.

Recommendations

Long term and frequent follow ups can be included. The comparative study between å groups can get more specificity to the study. Further studies can be done by using other reliable assessment tool.

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