

Research Article

Does the Advice to Assume the Knee-Chest Position at the 36th to 37th Weeks of Gestation Reduce the Incidence of Breech Presentation at Delivery?

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Abstract Breech presentation remains a hazard for the mother and her fetus. To reduce its incidence at delivery, postural techniques have been used, among which the knee-chest position. The objective of this study was to assess the effectiveness of this position on cephalic version of breech presentation. It was a prospective randomized study in a group of 102 women with viable fetuses in breech presentation at 36 to 37 weeks of gestation. The 49 women of the intervention group assumed the knee-chest position for 15 minutes three times a day for one week. The control group had 53 cases. The study and control groups were reviewed after a week to assess the fetal presentation. The version rate was 61% and 20% in intervention and in control groups, respectively (P value = .03). This position should be advised to women with fetus in breech between 36 and 37 weeks of gestation.

Keywords breech; knee-chest; version

1 Introduction

Breech presentation is a relatively common mode of presentation, found in 2% to 4% of pregnancies at term [3, 5, 12]. Several studies have shown an associated increased morbidity and mortality among babies in breech presentation who were delivered vaginally. Moreover, there is an increased morbidity to the mother because it is associated with an increased risk of cesarean section and episiotomy.

External cephalic version is recommended by some authors to reduce the incidence of breech presentation at term [7]. Randomized controlled trials of this method showed that it reduced the incidence of breech presentation at delivery. However, external cephalic version is not harmless at term [8], and some studies carried out before term suggest that the hazards of the procedure exceed the beneficial effect of the corrected malpresentation [8].

The Elkins procedure is an alternative measure to reduce the frequency of breech presentation at term [6]. In this method, the woman assumes a knee-chest posture for 15 minutes each day every 2 hours of waking time for 5 days. In one uncontrolled study, 71 women were advised to assume this posture and 91% of the fetuses turned and all the women proceeded to have a normal vaginal delivery [6]. This procedure was considered difficult in practice, and some authors [2, 13] have opted for a modified formula. In the modified Elkins procedure, the women assume the knee-chest position 15 minutes three times a day: one prior to getting up in the morning (preferably with a full bladder), one at midday, and the third one in the evening, for 7 days. It is a procedure that has been documented as safe [9] and experimented in many other studies [1, 2, 9, 11, 13] and is recommended for breech presentation to facilitate cephalic version [9], before attempting any potentially aggressive procedure like external cephalic version.

In controlled trials carried out using this modified Elkins procedure [2, 13], increased incidences of version were found in intervention groups, even though, with no statistically significant difference.

Chenia et al. [2] found in his post-hoc analysis that patients in whom the knee-chest position was successful were recruited at a significantly earlier gestational age (mean gestational age is 37.5 weeks) compared to those in whom the procedure was unsuccessful. (Mean gestational age is 38.8 weeks.) To increase the chances of successful rotation, we opted to enroll women between 36 and 37 weeks.

The objective of this randomized clinical trial was to assess whether or not assuming the knee-chest position had reduced the incidence of breech presentation at delivery.

For Elkins who observed 91% of rotation in an uncontrolled study, the women assumed the knee-chest position

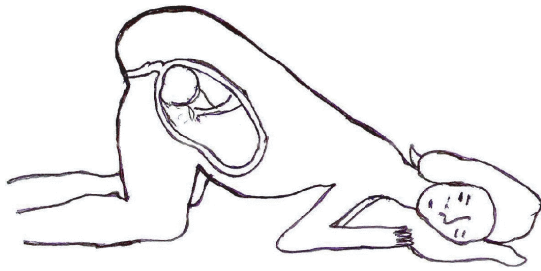


Figure 1: The knee-chest position.

for 15 minutes every 2 hours on waking for 5 days. To us this seemed difficult to practice. Other authors like Chenia et al. [2] used the modified Elkins procedure, with only 3 exercises daily. We adopted this modified procedure for this study with the innovation of using a gestational age of 36th to 37th weeks, age at entry during which the fetal presentation tends to be definitive.

2 Materials and methods

This was a randomized controlled clinical trial that took place in the District Hospital in Dschang (West Cameroon) which has about 130 beds, with a reproductive health unit where a mean of 140 deliveries are registered each month.

It targeted pregnant women who had had a singleton breech presentation clinically diagnosed between 36 and 37 weeks. An obstetric ultrasound examination using a 3.5 Mhz probe was done free of charge to all of them to confirm the breech presentation, the gestational age, the fetal weight and also to verify the site of implantation of the placenta. We excluded women with placenta praevia, those with a history of antepartum hemorrhage, and those who have had a previous uterine surgery, hypertensive diseases, documented uterine anomaly, prelabor rupture of membranes, risk of Rhesus iso-immunization, contraindication to vaginal delivery, intrauterine growth retardation and intrauterine death.

The protocol was submitted for evaluation to the National Ethic Committee. The study was carried out respecting the Helsinki declaration principles. After a clear explanation of the procedure, a written consent of each participant was obtained before her enrollment. Randomization was achieved using 110 sealed envelopes, 55 carrying letter "C", for control and 55 carrying letter "I" for intervention. Each eligible woman who consented to participate was asked to take one sealed envelope from the bag. The envelope was opened after the woman has taken it, to read the letter "I" or "C" explained above. The participants and investigators were blinded only before the envelope was chosen. The statistician was not blinded.

The sample size was calculated using a specified population proportion of breech presentation which is 4% [3] and the data in Table 5 [10]. Our study needed a sample size of at least 73 women.

Table 1: Home diary.

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Morning							
Midday							
Evening							

Make an "X" in the corresponding case box after the end of each exercise.

The 52 allocated in the Intervention group were asked to assume the knee-chest position for 15 minutes three times a day for one week (Figure 1). The first exercise is realized early in the morning, before getting out of the bed, preferably with full bladder, the second at midday, and the last one at bed time. This procedure was demonstrated to the women of the intervention group in the out-patient clinic, and each of them performed it under supervision to make sure that she will be able to achieve the position at home. Each patient was given a printed sheet with written instructions and a home diary (Table 1) to fill after each exercise. The women of the intervention group were reviewed in the antenatal clinic the following week. At follow-up, they were asked about any difficulties experienced with the procedure. Their home diaries were collected to evaluate their compliance on performing exercises. Those who were unable to perform 18 exercises or more (out of the 21 required) were excluded in the analysis. A second free of charge ultrasound examination was done to confirm the presentation and to evaluate the fetal well being, even for the cases excluded for poor compliance.

In the group of 53 women allocated in the control group, knee-chest position was not taught. They were only told to come back after one week for a control ultrasound. No sheet was given to them.

We followed up the women in both groups until delivery, and the information about fetal presentation at the onset of labor, gestational age at delivery, mode of delivery, and the babies' Apgar scores was collected from their medical record. The primary outcome was cephalic version.

The secondary outcomes were as follows:

- cesarean delivery rate;
- low baby's Apgar score after 5 minutes.

Our data were analyzed with Epi info 2000. The two groups were compared using Chi square for proportions, the difference being considered significant for P -value $< .05$. The Student's t -test was used to compare the means.

3 Results

3.1 Study population

A total of 105 women were randomized and enrolled in the study, 52 in the intervention group and 53 in the control group. At follow-up, 3 in the intervention group were excluded due to poor compliance. No case of loss-to-follow up was registered. Final analysis was done for 49

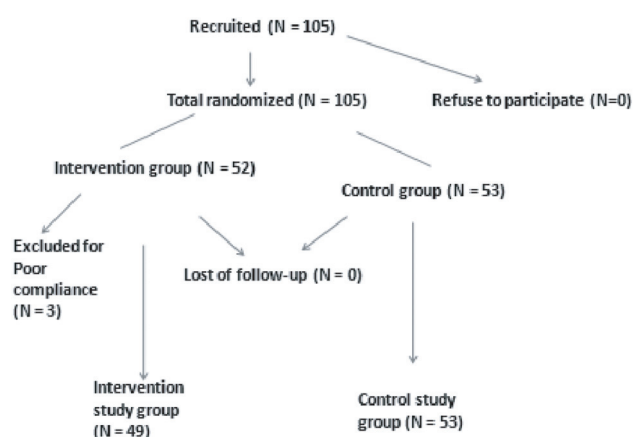


Figure 2: Flow chart of the study participants.

women in the intervention group and 53 in the control group (Figure 2).

3.2 Baseline characteristics

Participants baseline characteristics stratified according to age, parity, gestational age at entry, height, and weight are presented in Table 2. The two groups were comparable for these characteristics, as no significant difference was found between them. Approximately half of the participants in both groups had a parity of 4 and above, with 48.97% and 50.94% in the intervention and control groups, respectively.

3.3 Women's feedback about exercises

Fifty one percent of the participants in the intervention group described the exercises as bearable. For 35%, they were difficult, and only 9% declared them as easy (Table 3).

3.4 Comparison of outcomes in the two groups

Version has occurred during one week after recruitment in 30 (61%) of the 49 women in the intervention group. In 21 (40%) of the 53 women in the control group, fetuses underwent spontaneous version when reviewed after one week in the antenatal clinic (Table 4). The difference in version rate between the two groups was significant (P value = .03). No fetus in either study group in whom rotation was successful was found to be in breech at delivery. No fetus who failed to rotate at follow-up after one week was found to be cephalic at delivery. No significant difference was found in neonatal outcome between the two groups (Table 4).

3.5 Modes of delivery

In the intervention group, 6 (12.24%) women were delivered by cesarean section compared with 8 (17.09%) in control group (Table 5), with no significant difference. The indications of cesarean section were almost the same in both groups with fetal distress and cephalo-pelvic disproportion as leading causes, with 5 cases in each group.

Table 2: Comparison of patients in the intervention and the control study groups.

	Intervention group (n = 49)	Control group (n = 53)	P-value
Age	26.3 (5.9)	25.8 (6.2)	> .9600
Parity			
[0–1]	10	12	.7841
[2–3]	15	14	.6387
> 3	24	27	.8429
Gestational age at entry (weeks)			
36 weeks	20	23	.7920
37 weeks	29	30	.7920
Height	158.2 (5.1)	157 (6.7)	> .3100
Weight	73.5 (8.5)	74 (7.8)	> .7100

Table 3: How the women found the exercises.

	Easy	Bearable	Difficult	Total
Number	9	25	15	49
Percentage	18	51	35	100

4 Discussion

In this trial, the instructions given to women to assume the knee-chest position for 15 minutes three times a day over a week, as a modified Elkins procedure, was successful in converting breech presentation to cephalic presentation in 61% of the women as compared to a spontaneous version rate of 40% in the control group, with a statistically significant difference. But larger sample sizes and multicentric studies should be carried out to confirm these findings. Our rotation rate is lower than the 90% recorded by Elkins [6] who used the knee-chest position every two hours of waking time for five days. The reduced success rate in the maneuver may be due to the difference regarding the procedure in the intervention group. We decreased the frequency of knee-chest position to three times a day to increase patient compliance. Three women were excluded for poor compliance and 35% of the women in the intervention group found the exercises difficult.

After each demonstration to the woman, she was made to repeat the exercise under supervision in the outpatient clinic. The 21 exercises were then done at home, with no more supervision. We relied on the good faith of the women. It was not practically possible to keep the women in hospital for a week to supervise the execution of the procedure.

This trial was focused on women between 36 and 37 weeks of gestation, on one hand to minimize the chances of spontaneous versions which are high between the 30th and the 36th week [3,5] and on the other hand to act before the 38th week or more when the presentation is unlikely to change before delivery [3,5,12]. In a post-hoc analysis, Chénia et al. [2], working on women at the 37th week or more, found that patients in whom the Knee-chest position was

Table 4: Comparison of outcomes in the intervention and the control study groups.

	Intervention group (<i>n</i> = 49)	Control group (<i>n</i> = 53)	Relative risk (95% CI)	<i>P</i> -value
Rotation to cephalic	30 (61%)	21 (40%)	1.55	<i>P</i> = .0292
Gestational age at delivery (weeks)	39.5 (4.2)	40.15 (5.1)		> .4900
From entry to delivery (days)	20.3 (8.1)	21.8 (9.2)		> .4100
Birth weight (Kg)	3.25	3.31		> .7000
Apgar score < 7 (5 min)	4	3		> .4910

Rotation to cephalic between intervention and control groups; relative risk: 1.55 (1.04 < RR < 2.31).

Table 5: Modes of delivery.

Mode of delivery	Intervention group (<i>n</i> = 49)	Control group (<i>n</i> = 53)	Significance (<i>P</i> -value)
Normal vertex delivery	29	20	> .7958
Breech	14	25	> .7177
Cesarean section	6	8	> .8966

unsuccessful were recruited at a much later gestational age compared to those in whom the procedure was successful. It was based on this observation that we decided to choose the window period of 36–37 gestational weeks to carry out our study.

The high success rate observed in this study may be as a result of the fact that we targeted the gestational age of the study population in the interval between the 36th and 37th week. Using the same modified Elkins procedure, Chenia et al. [2] and Smith et al. [13] obtained increased success rates in intervention groups, but with no significant differences. In their studies, they enrolled women at 37 weeks or more period during which the position of the fetus is unlikely to change. Bung et al. [1] and Obwegeser et al. [11], in their series, had their fetuses at a younger gestational age, 30 to 35 weeks and 30 to 32 weeks, respectively. At these gestational ages, the chances of spontaneous version are high and this may constitute a confounding factor [3,5].

Table 6 which displays a comparison of different studies using the same or similar procedure but at different gestational ages shows that the percentages of version are high in both the test and the control groups between the 30th and 35th weeks and low after the 37th weeks.

The choice of the gestational age between 36 and 37 weeks at enrollment in our study may have contributed to have a significant difference between the two groups.

No case of return to breech after cephalic version neither a case of further version from breech to cephalic between the end of the procedure and the delivery were observed in our study. Our finding is similar to that of Elkins [6] and Chenia et al. [2].

The overall cesarean section rate was 14%. This rate is within the 10-15% cesarean section threshold recommended by the WHO in 1985 [14]. This rate is very low compared to the 25% and 65% reported by Chenia et al. [2] and Smith et al. [13] respectively, even though it is higher than the 8%

Table 6: Comparison between different studies using the same or similar procedure but at different gestational ages.

Author	Obwegeser et al.	Bung et al.	Present study	Chenia et al.
Year	1999	1987	2012	1987
Sample size	100	61	102	76
Gestational age	30–32	30–35	36–37	37 and more
Percentage of version				
Test group	70%	70%	61%	41%
Control group	63%	55%	40%	32%
Significance	NS	NS	<i>P</i> = .03	NS

recorded by Doh et al. [4] in 1990. In the world, the cesarean section rate differs from area to area, with a tendency to be higher in developed countries. In 2009, the WHO updated its recommendation, admitting that “no empirical evidence for an optimum percentage” exists and an “optimum rate is unknown”. It now recommends instead that world regions should make their choice.

No significant difference in the cesarean section rate was found between the two groups 12% and 15% for test and control groups, respectively. We found no significant difference in the Apgar scores between the two groups.

The absence of significant difference in the cesarean section rate and in the Apgar scores between the two groups supports the necessity of the knee-chest position. Concerning cesarean section rate, breech presentation only is not enough as an indication of cesarean in our country; if that was the case as in some developed countries [5, 13] we would have found a significant difference between the two study groups. Concerning the Apgar scores, our obstetricians and midwives have good experience in breech delivery and this may have contributed to this nonsignificant difference. In health facilities especially in poor community health centers where general practitioners and nurses have little experience in managing breech cases in labor, the Apgar scores could have been different between the two groups.

5 Conclusion

This study showed that advising women with fetuses in breech presentation between the 36th and 37th weeks to use the knee-chest position for 15 minutes three times a day was safe, simple and significantly reduced the incidence of breech presentation at delivery.

From these findings we believe that the knee-chest position is to be advised in breech presentations between the 36th and 37th weeks of gestation. However, other studies in different areas with larger sample sizes and at this gestational age interval should be carried out to confirm these findings.

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