



ROLE OF BREATHING EXERCISES ON THE DURATION OF SECOND STAGE OF LABOR: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Background: Labor is a unique experience. At times it's over in a matter of hours and sometimes, it tests a mother's physical and emotional stamina. Certain types of breathing exercises can help parturient to feel more relaxed during labor. There are scarce evidence concerning the effectiveness of breathing exercises on the duration of labor. This study aimed to appraise the evidence concerning the effectiveness of breathing exercises on the duration of second stage of labor. **Methodology:** We compared 166 pregnant women in their second stage of labor who performed breathing exercises as instructed, versus a control group who received standard care. **Results:** Baseline characteristics of participants in both the groups (IG and CG) were matched for age, education level, socio economic status, BMI and parity. Mean duration of the second stage of labor (in seconds) in IG is 540.6 ± 122.1 and in CG is 660.7 ± 142.5 . The mean birth weight of the newborns (in grams) was (2981.0 ± 537.1) in IG and (2860.1 ± 464.3) in CG ($P > 0.05$). **Conclusion:** Expected mean duration of second stage of labor can be effectively shortened by deep breathing exercises, consistent with previous reports in the literature. Therefore, breathing exercises can be used as non pharmacological method for effectively reducing the duration of labor.

KEYWORDS : breathing exercise; laborduration; non pharmacological method; randomized study; second stage of labor

1. INTRODUCTION

Labor is a unique experience. At times it's over in a matter of hours and sometimes, it tests a mother's physical and emotional stamina. Labor dystocia or abnormally prolonged labor, is a common complication of parturition and is the reason for about half of unplanned cesarean deliveries in low-risk nulliparous women.⁽¹⁾ Though there are continuing efforts to decrease the rate of cesarean deliveries, experts do not anticipate a significant decline for at least a decade or two.⁽²⁾

Pregnant women are easily susceptible to anxiousness or nervousness which in general, increases the risk of dystocia.⁽³⁾ Childbearing itself is a stressful event. Mother's anxiety in terms of child birth is known to be associated with a less positive experience and lower satisfaction with the birth.⁽⁴⁾ Anxiety was found to rise concomitantly with the level of duration of labor in women of all personality types. Anxiety could persist even after adequate pain relief was achieved.⁽⁵⁾ Certain types of breathing exercises can help parturient to feel more relaxed during labor. There are scarce evidence concerning the effectiveness of breathing exercises on the duration of labor.⁽⁶⁾

This study aimed to appraise the evidence concerning the effectiveness of breathing exercises on the duration of second stage of labor.

2. METHODS

2.1 Study design

In this study, we compared pregnant women in their second stage of labor who performed breathing exercises as instructed, versus a control group who received standard care. The study was conducted at JLNH&RC Hospital, Obstetrics and Gynecology Department, between January 2023 and July 2023, in Bhilai, Chhattisgarh.

2.2 Inclusion and exclusion criteria

Pregnant women with gestational age between 37 to 42 weeks were included.

Parturient who received epidural analgesia, and those with cardiac disorders and inability to cooperate with breathing

exercises were excluded. Smokers were excluded.

Hence, 166 women were selected.

The patients were randomly allocated to intervention group (IG; $n = 83$) or control group (CG; $n = 83$). The study was conducted after the approval of the Institutional Ethics Committee (IEC). An informed written consent was obtained from each participant.

2.3 Intervention

Intervention group was given breathing exercise training in third trimester and first stage of labor and were instructed to perform abdominal breathing during the second stage.⁽⁷⁾

In third trimester patient was asked to practice deep breathing - long breath in followed by breathing out slowly from mouth.

During first stage of labor the main components of breathing exercises were:

- I. A deep breath as soon as the contraction begins.
- II. Release all tension.
- III. Tuck chin to chest, curl your body and lean forward.
- IV. Try to push the baby downward either by holding breath or breathing out slowly from mouth.
- V. Continue pushing until the pain is relieved.
- VI. In breaks, breathe deeply providing oxygen to baby.

The participants' breathing progress and duration of second stage of labor was monitored.

2.4 Data collection

The primary outcome was to measure the effect of breathing exercises on the duration of second stage of labor which was recorded in seconds for all participants. All data collection was done by the principal investigator.

2.5 Data analysis

For statistical analyses, data were used by the SPSS program for Windows, version 20.0. Continuous variables were presented as mean \pm standard deviation (SD), and categorical variables were presented as absolute numbers and percentage (%). Data were checked for normality before

statistical analysis. Normally distributed continuous variables were compared using the unpaired t test, whereas the Mann-Whitney U test was used for those variables that did not show normal distribution. Categorical variables were analyzed using either the chi square test or Fisher's exact test. A P value less than 0.05 was considered statistically significant.

3. RESULTS

Figure 1 depicts flow chart of a total of 200 parturients, of which 14 were excluded based on inclusion and exclusion criteria. There was no loss to follow-up.

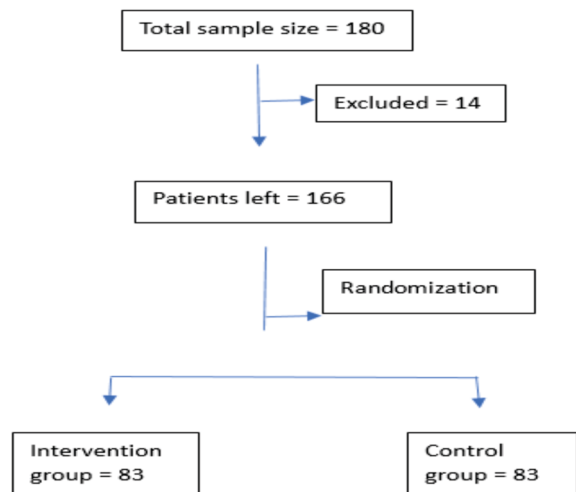


Figure 1. Number of sample

Table 1 depicts baseline characteristics of participants in both the groups which were matched for age, education level, socio economic status, BMI and parity (P > 0.05).

Table 1. Characteristics of participants

Variables	Intervention group (83)	Control group (83)	P value
Age ((mean ± standard deviation, years))	27.4 ± 3.6	26.8 ± 3.8	> 0.05
Education(n, %)			> 0.05
Undergraduate	13(15.66%)	11(13.25%)	
Graduate	43(51.81%)	49(59.04%)	
Post graduate	27(32.53%)	23(27.71%)	
Socio economic status(n, %)			> 0.05
Low	20(24.10%)	22(26.50%)	
Medium	52(62.65%)	49(59.04%)	
High	11(13.25%)	12(14.46%)	
BMI (pre pregnancy)(n, %)			> 0.05
Underweight	16(19.28%)	14(16.87%)	
Normal	42(50.60%)	48(57.83%)	
Overweight	23(27.71%)	20(24.10%)	
Obese	2(2.41%)	1(1.20%)	
Parity(n, %)			> 0.05
Primiparous	19(22.89%)	15(18.07%)	
Multiparous	64(77.11%)	68(81.93%)	

Mean duration of the second stage of labor (in seconds) in IG is 540.6 ± 122.1 and in CG is 660.7 ± 142.5.

The mean birth weight of the newborns (in grams) was (2981.0 ± 537.1) in IG and (2860.1 ± 464.3) in CG (P > 0.05).

4. DISCUSSION

There is a famous saying "Exercise is the medicine." In our study we found out that breathing exercises provided

significant reduction in the duration of second stage of labor. During a uterine contraction, unconscious breathing alters into a more voluntary act. In second stage, fetus descends and compresses both bladder and rectum creating a reflex to bear down. So, all the involuntary and voluntary forces help in delivering fetus. Therefore, strategies to facilitate voluntary uterine contractions can help to control the second stage of labor.⁽⁸⁾ We trained the participants in deep inhales and exhales in third trimester which they performed in second stage of labor. It provided active contraction and oxygenatation of pelvic floor and abdominal muscles.⁽⁹⁾

In our study, the second stage of labor was shorter in the intervention group than in control group as breathing exercises can help in organised push. However, battery of other factors can also affect the duration of second stage like mother's push and comorbid medical conditions (obesity, hypertension, diabetes and anemia).[22] So, we conclude based on our study results, that expected mean duration of second stage of labor can be effectively shortened by deep breathing exercises, consistent with previous reports in the literature. However, few high-quality large scale studies could provide strong evidence about its efficacy.

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