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Effect of Left lateral position on Intrauterine Fetal Resuscitation among Pregnant Women with Reduced Fetal Movements

Ahlam Mohammed Ibrahim Gouda.&NahedFikry Hassan Khedr.

Woman's Health and Midwifery Nursing Department,
Faculty of Nursing, Mansoura University, Dakahlia, Egypt.

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Abstract: Background: decreased fetal movement (DFM) is a common problem among pregnant women. It has for some time been perceived that position in late pregnancy can profoundly affect maternal hemodynamic. Left side lying position allowselevating uterus from the inferior vena cava and improves maternal hemodynamic and gas exchange.**Aim:**evaluate the effect ofleft lateral position onintrauterine fetal resuscitation among pregnant women with reduced fetal movements. **Method:** Design: Quasi- experimental research design. **Setting:** study performed at Obstetrics and Gynecology department of EL - Mansoura University Hospital.**Subjects:**purposive sampling technique was used to select study subjects {N= 80} of pregnant womencomplaining from reduced fetal movements in third trimester, subjects were divided randomly into two equal groups. **Tool:**one tool was used for data collection, itconsists of three parts (Socio – demographic data, obstetrical history andfetal movements recording card).**Results:**highlystatistically significant difference of fetal movements amongintervention group post interventionthan the control group; the mean offetal movements was (3.25+1.5 versus 2.9+1.3 respectively).**Conclusion:** Maternal rest in left lateral position improved fetal movements.**Recommendations:** Pregnant women complaining from decreased fetal movements in third trimester should be instructed about the important of rest in left lateral position to establish proper fetal movements.

Key words: left lateral position, intrauterine fetal resuscitation and reduced fetal movement.

INTRODUCTION

The prenatal mortality and morbidity rates continuously increments all through pregnancy, Also it istime of hazard for mother and fetus. To diminish these rates, early identifications of high-risk pregnancies and quick referrals are of vital significance. (Anna Akselsson et al., 2017 &Lohana et al.,2013).

The fundamental objective of routine antenatal care is early discovery of pregnancy complications and permitting better management, hence improve the condition of both mother and fetus. (Radestad, Lindgren, 2012). Fetal movements characterized as "separate kick, shake and are ordinarily first saw by the mother in the vicinity of 18 and 20 weeks of growth". The repeat of fetal developments achieves a level in gestational week 32 and remains at the same until birth (Royal College of Obstetricians and Gynaecologists; 2011).

A diminishment of fetal movements causes concern and uneasiness for the mother and obstetrician; it is additionally a typical explanation behind referral to hospital. Diminished fetal movements affect 5–15% of pregnancies;1,285% of these women are anxious about fetal wellbeing and 53% are afraid that the baby may lose. However, mothers' perception of reduced fetal movements is very subjective and any worries ought to be considered important.(Julia Unterscheider et al.,2009).

Quickening consequently the dynamic increment in quality, recurrence and liquidity of fetal movements as gestation progresses correspond with traditional growth and wellbeing of the fetus. Fetal movements are an outflow of typical fetal

life systems, cardiovascular and neurologic capacity. Abnormal movements are incontestable in anencephalious fetuses and fetuses with auxiliary variations from the norm.(Visser, et al. 2010).There is typical variety in fetal movements with a wide range in number of movements every hour (Nowlan.2015). The movements are happening consistently for the duration of the day and night, regularly going on for 20– 40 min. The rest cycles seldom surpass 90 min in the ordinary and sound hatchling. Despite the fact that the movement example of vitality of fetus, it is general learning that diminished fetal development may indicating stillbirth (HolmTveit et al..2009).

It has for quite some time been perceived that position in late pregnancy can profoundly affect maternal hemodynamic. Specifically, amid the recumbent position packs the uterus from the substandard vena cava resulting in restriction of venous return, decreased cardiac output, and along these lines debilitated uterine perfusion. (Raynes-Greenow, et al.2013).Disappointmentto prevent this pressure can cause maternal recumbent hypotensivesyndrome (otherwise called inferior vena cava compression syndrome) and in the long run can produce badoutcome on gas exchange amongst mum and fetus with resulting fetal heart rate decelerations. Since the 1950s it has been a standard of care to place laboring pregnant women in the left side position to remove the uterus from the inferior vena cava and thereforeenhance maternal hemodynamics and gas exchange (O'Brien & JaneWarland,2014).

Intrauterine fetal resuscitation (IUF) plans to maintain oxygen delivery till the fetus can be delivered if there is placental disturbance. IUF comprises of applying pregnant

woman on left lateral position to release aortic caval compression, tocolysis, rapid intravenous fluid infusion and high-flow oxygen to increase fetal oxygen saturation. IUGR measures are easy to achieve, don't require broad assets, and can result in significant enhancements in fetal wellbeing. (Simpson & James, 2005)

Maternal recumbent position in late pregnancy mostly obstruct the aorta, because of the large uterus, and result in reorganization of blood flow and more nonreactive fetal heart rate traces. (Khatib, *al.*, 2014 & Armstrong, *et al.*, 2011). Besides, recumbent position was additionally appeared to cause circulatory changes in the fetus. The umbilical artery Systolic/Diastolic (S/D) proportions were considerably increased with the recumbent position than in different lateral positions, indicating that the umbilical artery vascular resistance is expanded once mothers change position (El-Shahawy, *et al.*, 2016).

SIGNIFICANCE OF THE STUDY

Maternal awareness of fetal movement is a vital screening manner for fetal well-being, as diminished fetal movement is linked with a range of pregnancy pathologies and poor pregnancy outcomes (Hijazi 2009). Maternal awareness of fetal movement is reassuring for pregnant women, while decreased fetal movement (DFM) is a common reason for concern. At least 40 percent of pregnant women become concerned about DFM one or more times during pregnancy (Saastadet *al.*, 2012). Four to 15 percent of pregnant women will contact their care provider because of persistent DFM in the third trimester (Saastadet *al.*, 2009).

From clinical experience it was observed that many cases admitted to high risk unit complained from reduced fetal movements and there is no any natural intervention was done to overcome this problem. The maternity nurse has many opportunities in influencing the care of pregnant women with reduced fetal movements. One of these areas is advice the women to rest in left side position. In addition researches are also lacking about concerning importance of maternal left lateral position and its effect on intrauterine resuscitation, thus, it is essential to study this point

Aim of the Study: The study aimed to evaluate the effect of left lateral position on intrauterine fetal resuscitation among pregnant women with reduced fetal movements.

Hypothesis: pregnant women who perform left lateral position exhibit more fetal movements than those who don't assume.

Study Design: Quasi- experimental research design.

Study Setting: This study was performed at the Obstetrics and Gynecology department of EL - Mansoura University Hospital.

Type of Sample: -purposive sample

Sample Size:

The study included 80 pregnant women. Sample size was computed according to the following formula:

$$n = [2(Z_{\alpha/2} + Z_p)^2 \times p(1-p)] / (p1 - p2)^2$$

Where n = sample size needed in each group, p = pooled proportion (proportion of event in group 1 + proportion of event in group 2)/2 p1-p2 = difference in proportion of events in two groups Z_{α/2}: This depends on level of significance, for 5% this is 1.96

Z_p: This depends on power, for 80% this is 0.84 Based on above formula the sample size required per group is 29.98 in each arm. Hence the sample size required is 40 pregnant women in each group.

Subjects: The study comprised of 80 pregnant women complaining from reduced fetal movements in third trimester, the groups were divided into intervention and control group (40 for each group) according to random assignment. They were chosen according to the following criteria:

Inclusion Criteria:

- Maternal age 20-35 years.
- Decreased fetal movement
- Singleton pregnancy.
- Intact membranes.
- Gestational age between 36 to 40 weeks, not in labor.
- Free from any obstetrical and medical diseases.
- Uncomplicated pregnancy.

Tool of Data Collection: A structured interview schedule was formulated by the researchers after revising related literatures. It consists of three parts as the following **Part I:** Included subjects' general characteristics such as age, residence, telephone number, education and occupation. ..etc. **Part II:** Contained their past and present reproductive history such as gravidity, parity etc... **Part III:** Entailed fetal movements counts through asking women to count the fetal movement (Kick count), before and after intervention and recording it as the following:

| | Fetal movements counting | | | Notes |
|----------|---|---|---|-------|
| | 1 st day Pre- intervention (baseline data) | 2 nd day Post- intervention | 3 rd day (After one week of intervention) | |
| 1st hour | | | | |
| 2nd hour | | | | |

Tool Validity:

Tool utilized in research were produced by the researchers after checking of the present national and worldwide related literary works utilizing books, articles and scientific journals. This helped to be aware with the problem, and guided in the process of tools' designing. Tool was tested by three juries from experts in maternity nursing field tested the content validity. According to expert's suggestions the tool was modified.

Pilot Study:

Pilot study phase was performed for one month (June 2017) at Obstetrics and Gynecology Department of Mansoura University Hospital on 10% of the sample size (8 pregnant women) to test the applicability & significance of the research tool & the clearness of the designed questionnaire and the required modification were made. The pilot sample was excluded from the study.

Field Work:

This study was started at the beginning of August (2017) to the end of January (2018). During the research period, the researchers were attended at Obstetric and Gynecologic Department of Mansoura University Hospital from 9 am to 1 pm for three days per week. The specialist acquainted herself with every one, the motivation behind the investigation was disclosed to every lady and educated assent was taken before examine. All women in the study had the right to the privilege to pull back at any time during the research period. Every woman in the two groups was assessed individually by using the previous mentioned tool. Woman in intervention group was requested to lie in left

lateral position for 2 hours in the first interview in the presence of researcher and then taught to keep in this position for 2 hours and count any fetal movements and recorded it 3 times (pre-intervention, at second days from intervention and after one week post intervention) Control group were followed routine care and asked to count fetal movements and recorded it.

Ethical Considerations:

- Moral endorsement was procured from the Research Ethics Committee of the Faculty of Nursing, Mansoura University. Official authorizations were acquired from the pioneer of the Obstetrics and Gynecology Department and the Director of Mansoura University Hospital. The aim of the study was explained to the studied groups and written consents were obtained from pregnant women recruited in the study after explanation objectives of the study. Women were consoled about the Anonymity, wellbeing & security of the gathered data throughout the whole study. Cases were educated about their rights withdraw from study at any time.

STATISTICAL ANALYSIS

Every statistical analysis was done using SPSS for windows version 20.0 (SPSS, Chicago, IL). Data was tested for normality of distribution earlier to any calculations. Continuous data were stated in mean \pm standard deviation (SD) as they were normally distributed. Categorical data were expressed in number and percentage. The comparisons were resolute using Student's t test for variables with continuous data of normal distribution while Chi-square test was used for comparison of variables with categorical data. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1. Number and percent Distribution of the study subjects According to their Socio-demographic (n=80)

| Socio-demographic Characteristics | Intervention Group | | Control Group | | Chi square test | |
|-----------------------------------|--------------------|-------|----------------|------|-----------------|-------|
| | n= (40) | % | n= (40) | % | | |
| Age (years) | | | | | | |
| <25 | 14 | 35.0 | 10 | 25.0 | | |
| 25 – <30 | 16 | 40.0 | 16 | 40.0 | 1.333 | 0.513 |
| ≥ 30 | 10 | 25.0 | 14 | 35.0 | | |
| Mean \pm SD | 27.0 \pm 4.2 | | 28.0 \pm 4.5 | | 1.055* | 0.295 |
| Residence | | | | | | |
| Rural | 26 | 65.0 | 22 | 55.0 | 0.833 | 0.361 |
| Urban | 14 | 35.0 | 18 | 45.0 | | |
| Educational level | | | | | | |
| Basic | 0 | 0.0 | 1 | 2.5 | 1.013 | 0.314 |
| Higher | 40 | 100.0 | 39 | 97.5 | | |
| Occupation | | | | | | |
| Housewife | 30 | 75.0 | 34 | 85.0 | 1.250 | 0.264 |
| Working | 10 | 25.0 | 6 | 15.0 | | |
| Marital status | | | | | | |
| Married | 36 | 90.0 | 38 | 95.0 | 1.254 | 0.534 |
| Divorced/ Widow | 4 | 10 | 2 | 5.0 | | |
| | | | | | | |
| * t value, independent test | | | | | | |

Table (1) shows that there was no statistical significant difference among the subjects regarding their socio-

demographic characteristics. The mean age of the intervention and control group nearly the same (27.0

±4.2&28.0 ±4.5respectively). Nearly two third (65.0%) of intervention group coming from rural areas. Regarding educational level it was obvious that majority of study

subjects highly educated. In addition, more than three quarter (85.0%) of control group were house wives.

Table2. Number and Percent Distribution of the Study Subjects According to Their Reproductive History.(n=80)

| Reproductive History | Intervention Group | | Control Group | | Chi square test | |
|-----------------------------------|--------------------|-----------|---------------|-------|-----------------|-------|
| | n= (40) | % | n= (40) | % | | |
| Gravidity | | | | | | |
| One | 9 | 22.5 | 5 | 12.5 | 1.758 | 0.415 |
| Two | 11 | 27.5 | 15 | 37.5 | | |
| Three or more | 20 | 50.0 | 20 | 50.0 | | |
| Antenatal class attendance | | | | | | |
| Irregular | 8 | 20.0 | 15 | 37.5 | 2.990 | 0.084 |
| Regular | 32 | 80.0 | 25 | 62.5 | | |
| Number of Miscarriages | | | | | | |
| None | 36 | 90.0 | 35 | 87.5 | 0.125 | 0.723 |
| One | 4 | 10.0 | 5 | 12.5 | | |
| Gestational age | | | | | | |
| <32 weeks | 24 | 60.0 | 17 | 42.5 | 2.452 | 0.117 |
| >32 weeks | 16 | 40.0 | 23 | 57.5 | | |
| Mean ±SD | 30.4 ±4.0 | 31.9 ±4.6 | 1.567* | 0.120 | | |

* *t* value, independent test

Table (2) shows that there was no statistically significant difference in the reproductive history among the two groups.

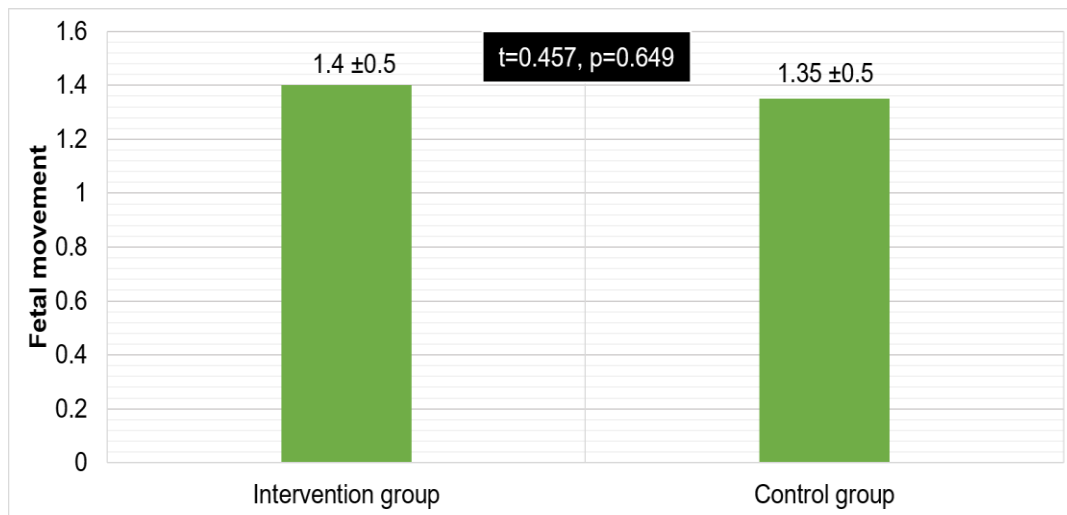


Figure 1. Fetal movements among both groups at baseline (pre- intervention)

Figure 1. Demonstrates that mean of fetal movements is nearly the same pre intervention and no statistical significant differences between both groups.

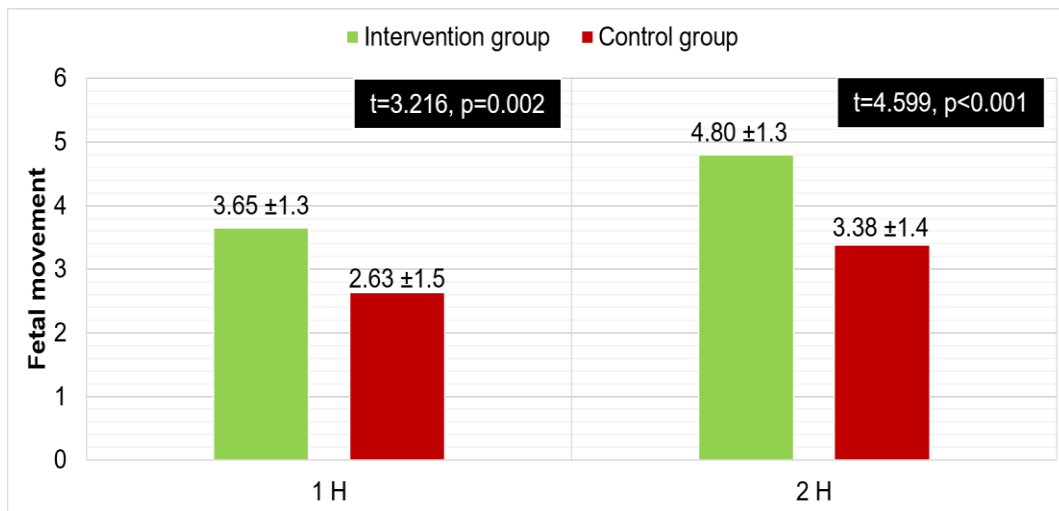


Figure 2. Fetal movements among both groups at second day post intervention.

Figure 2. Illustrate that mean of fetal movements are slightly increase among intervention group than control group on thesecond day post intervention at 1st and 2nd hour and

there was highly statistical significant difference (p value = 0.002 & p value = <0.001).

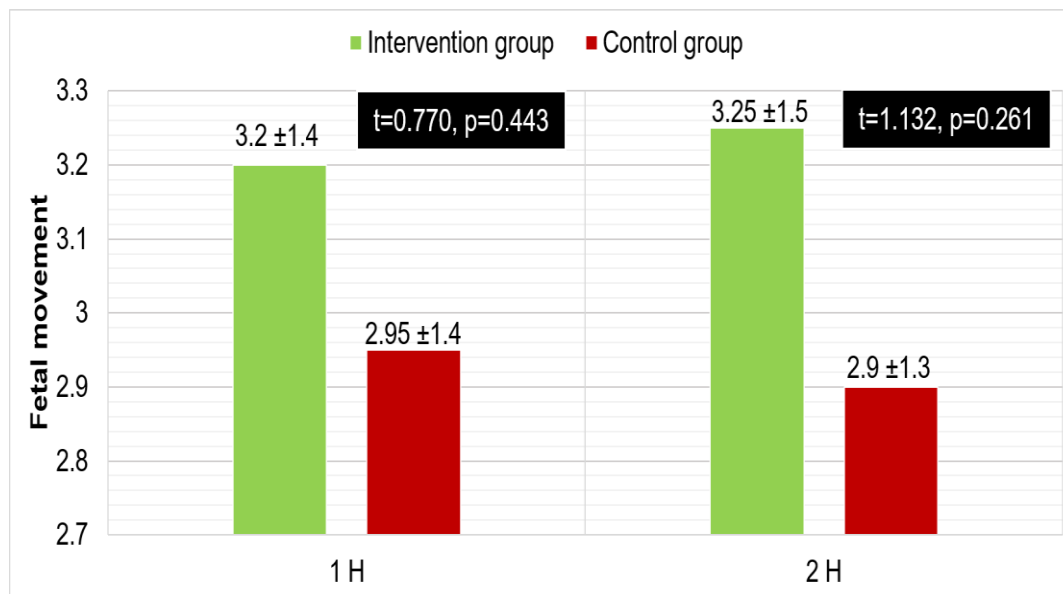


Figure 3. Fetal movements among both groups one week after intervention.

Figure 3. Represents that mean of fetal movements are higher among intervention group than control group.

DISCUSSION

Fetal movement is viewed as an indication of fetal life, and regularly creating fetal neurological, cardiovascular and musculoskeletal systems. The fetus lessens movement to decrease need for oxygen and energy (Warrander *et al.*, 2012). Above fifty of the mother reported intrauterine fetal death, they complained from lessened fetal activity before diagnosis. (O’Sullivan *et al.*, 2009 & Tveit *et al.*, 2009).

The current study aim to evaluate the effect of left lateral position on intrauterine fetal resuscitation among pregnant women with reduced fetal movements. This objective was significantly supported with the current study hypothesis. The current study was conducted on two equal groups and both were almost similar regarding the general characteristics and reproductive history. The present study

findings showed no statically significant differences between the study group regarding fetal movements at baseline pre intervention, while after interventions there were significant differences among both groups.

The present study findings revealed that absence of any statistically significant differences concerning reproductive history and fetal movements among the control and intervention groups. These results were contradicted with (Torshizi, 2013 & Kobra Salehi *et al.* 2017), who investigate different scopes of maternal-fetal attachment behaviors and related factors in pregnant women who found that some of the demographic and prenatal characteristics like mothers’ and their husbands’ educational levels, their occupation and number of pregnancies and gestational age, were related to maternal-fetal attachment.

Changing woman position may affect on fetal state by hindering oxygenation for example, pressure of the inferior vena cava when supine or by decreasing accessible space for unconstrained movement. (Stacey *et al.*, 2011).The current study findings revealed that the intervention group; who applied on left lateral position while counting fetal movement for two hours had higher percentage of fetal movements count at end of first week than control group, the mean of fetal movements of intervention group after one week of intervention were higher than the control group (3.25+1.5 versus 2.9+1.3 respectively).Such findings in agreement with Minors & Waterhouse (1979),who conducted a study about effect of different position on fetal movements, the pregnant women in this study maintain notes of fetal movements were perceived and the woman's position at this time. They found that side lying position was associated with increased fetal movement, sitting less movements, and upright position with the least movements.

In the same line with current study Faraget. al.,2016,They described that maternal prone position in late conception partially blocks the aorta and more nonreactive fetal heart rate traces. Additionally, recumbent posturesource of circulatory changes in the fetus. The umbilical artery S/D ratios were significantly higher in the supine than in other lateral positions, indicating that the umbilical artery vascular resistance is improved when the mother changes position.

CONCLUSIONS

Based on findings of this study we concluded that maternal rest in left lateral position improve intrauterine resuscitation, maintain fetal circulation and improved fetal movements.

RECOMMENDATIONS

Based on the present study findings, we recommended that pregnant women complaining from decreased fetal movements in third trimester should be instructed about the important of rest in left lateral position to establish proper fetal movements, seeking immediate help for any concern regarding any alteration in fetal movement. Also antenatal educational program including information related to nature of fetal movement and different methods for counting fetal movement should be integrated into routine antenatal care in general practice.

LIMITATION OF THIS STUDY

There are a few scientific researches that dealt with this subject and also a lack of scientific references.

ACKNOWLEDGMENT

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CONFLICTS OF INTEREST DISCLOSURE

The author declares that there is no conflict of interest statement.

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