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Original Research Article

A Prospective Study to Assess Various Causes and Perinatal Outcomes in Women at Term Gestation with Complaint of Reduced Fetal Movement

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Abstract

Background: Fetal Movements provide simple measure of fetal well-being. Perception of fetal movements that are normal for that pregnancy generally reflects an appropriately functioning central nervous system and adequate oxygenation. A reduction in or absence of FMs may indicate fetal compromise or death. Raising awareness of the importance of FMs and advising women on the appropriate action to take if they experience reduced FMs is thus important for minimising or avoiding adverse perinatal outcomes.

Methods: it was a prospective study conducted on 234 antenatal consenting booked women between 18-35 years of age after 37 completed weeks of gestation. Among these women 117 belonged to complain of reduced fetal movement (cardiff count to ten method) and rest 117 were randomly selected women after matching. Detailed history, examination, USG with cds and CTG findings were used to assess the associated cause and followed till delivery to study perinatal outcomes

Result: In the present study, it was found that those pregnant women in their third trimester of pregnancy evaluated on basis of decreased fetal movement had some identifiable causes and was associated with poor perinatal outcomes in terms of low APGAR score and NICU admission.

Conclusion: Cardiff count to ten methods is subjective way and when it is followed by USG and CTG findings can be used as reliable screening method for diagnosing women with high risk pregnancies.

INTRODUCTION

Fetal movement refers to motion of a fetus caused by its own muscle activity and this locomotor activity begins during the late embryological stage and it changes in nature throughout development. Muscles begin to move as soon as they are innervated. These first movements are not reflexive, but arise from self-generated nerve impulses originating in the spinal cord. As the nervous system matures, muscles can move in response to stimuli.[1] The most well-known method being the "count-to-ten" or "Cardiff method", introduced by Pearson in 1977[2].Various causative factors are associated with reduced fetal movement example – placental insufficiency, IUGR, oligohydroamnios, smoking sedating drugs like alcohol, benzodiazepines etc. hyperglycemia[3-6].perinatal outcomes like Low APGAR SCORE ,academia ,NICU admissions are often with reduced movement.

AIMS AND OBJECTIVES

To assess the various causes of reduced fetal movement in women at term.(reduced fetal movement according to cardiff count to ten method) and also to assess perinatal outcomes in women having reduced fetal movement.

MATERIAL AND METHODS

Pregnant women attending antenatal clinic at the Department of Obstetrics and Gynaecology at a teaching hospital in Jaipur were included in the study after taking written informed consent and.The patients were then divided into two groups and named as cases and controls. Cases included women with complain of reduced fetal movement as per Cardiff count to ten method and were compared to randomly selected women without any complain of reduced fetal movement. Eligible participants were pregnant women who were in their third trimester (>37 weeks) having singleton live pregnancies and women giving written and informed consent. Pregnant women who had diagnosed congenital anomalies were excluded. Through history and general physical examination was carried out. Obstetric examination was done to

record the fetal lie, presentation, localize the fetal heart sound and to note the presence/absence of uterine contractions. Investigations done were routine antenatal investigations that included Hemoglobin, Blood group, Blood sugar level, HIV, VDRL, Hepatitis B Antigen and Urine complete and microscopy. Ultrasonography was done for fetal well-being and Colour Doppler and biophysical profile. Further cardiotocography was done to record reassuring or non-reassuring fetal heart rate and its characterstics. Further management was done as per respective findings and protocol of the hospital and these women were followed for various outcomes.

MATERNAL OUTCOMES It was studied as MODE OF DELIVERY

- Vaginal - Induced or Spontaneous; or
- Caesarean Section

NEONATAL OUTCOMES -Viability at birth (still birth / alive),APGAR score at birth and at 5 minutes, Rate of NICU admissions, Prognosis of fetus.

Continuous data were summarized in the form of mean and standard deviation (SD). Difference in means of the two groups were analysed using unpaired student's t test. Counted data were expressed in form of proportions and chi square test was used for their analysis. The level of confidence was kept 95% for all the statistical analysis.

RESULTS

As per table 1 Maximum number of participants among cases (43.6%) belong to 18-25 years of age group whereas maximum number of participants among controls (54.7%) belong to 26-30 years of age group i.e women with decreased fetal movement comparatively belonged to early age group.

Maximum number of participants (73.5%) in the Case group were nullipara (Para: P0).Maximum number of participants (69.2%) in the Control group were nullipara (Para: P0).Although both group had maximum participants in nullipara group but women with complaint of decrease fetal movement were more in number i.e 86 out of 117 women in the study group.

Among women who complaint of decrease fetal movement had high risk factors as follows-7.7% i.e 9 out 117 cases were postdated pregnancy ,10.3% i.e. 12 out of 117 were hypertensive ,3.4% i.e. 4 out of 117 had gestational diabetes mellitus,1.7% i.e. 2 out of 117 were smokers.

Among control i.e. women without complaint of any decrease fetal movement had following high risk factors-10.3% i.e. 12 out of 117 were postdated pregnancy,6.8% i.e. 8 out of 117 were hypertensive,2.6% i.e. 3 out of 117 had gestational diabetes mellitus but none of them were smokers.

As observed in table 2 There was no significant difference between the various groups in terms of distribution of USG: Amniotic Fluid Index ($\chi2 = 3.029$, $p = 0.202$). Study result signifies that women with decrease fetal movement perception have more incidences of oligo as well as polyhydroamnios.

As observed in table 3 There was a significant difference between the various groups in terms of distribution of USG: Placenta Location ($\chi2 = 47.376$, $p = <0.001$).
37.6% of the participants in the Case group had USG: Placenta Location: Anterior Upper.

39.3% of the participants in the Case group had USG: Placenta Location: Fundal.

2 women (1.7%) in the case group had placenta previa. In contrast 23.9% of the participants in the Control group had USG: Placenta Location: Anterior Upper.This study signifies that women with decreased fetal movement had placenta anteriorly located.

According to table no. 4 11.1% of the participants in the Case group had [USG: Colour Doppler: Uteroplacental Insufficiency and 6.0% of the participants in the Control group had USG: Colour Doppler: Uteroplacental Insufficiency.
47.9% of participants in the case group had Induction of Labor as compared to control where only 27% women had induction of labour.The study result signifies that women with decrease fetal movement had more incidence of induction of labour as compared to controls.

As observed in table 5 There was significant difference between the various groups in terms of distribution of NICU Admission ($\chi2 = 3.140$, $p = 0.076$).14.2% of the participants in the Case group had NICU Admission,7.0% of the participants in the Control group had NICU Admission.

DISCUSSION

Following study is a prospective study to find out causes on the basis of demographic factors and investigations.
Jessica M Turner et al did a similar study in 2021 to evaluate the pregnancy outcomes in women with decreased fetal movement Women with DFM, compared with women without DFM, were significantly younger (mean [SD] age, 30.4

[5.4] years vs 31.5 [5.2] years; P < .001). Nupur Nandi et al also had similar study results in her study (2019) showing that majority of women in study group belonged to early age group i.e between 20-30 years of age.

A study by BN Olagbuji et al in 2014 also showed similar findings stating that among 225 women taken in study half of them were nulliparous.

Greentop guideline no 57 on reduced fetal movement published in 2011 states that high risk factors like known fetal growth restriction ,hypertension , diabetes, extremes of maternal age , primiparity, smoking, obesity, previous still birth are responsible for reduced fetal movement.

Mahdi Sheikh et al in 2014 in a cohort study about Maternal perception of decreased fetal movements from maternal and fetal perspectives provided similar results as this study showing in the ultrasound studies, 684 mothers had a normal AFI (96.2%), and 20 had polyhydramnios (AFI of > 25 cm or at > 97.5th percentile) (2.8%), 7 had oligohydramnios (AFI of < 5 cm or at < 2.5th percentile) (0.9%).

Lorraine Carroll et al (2018) did a comparative study including multiple studies for decreased fetal movement concluded that women presenting with RFM during pregnancy are more likely to be Caucasian, smokers, and have an anterior placenta, oligohydramnios and polyhydramnios.

Meena Bhatia et al in 2019 studied multiple variables related to decrease fetal movement and perinatal outcomes had induction of labour in among 43.1% cases.

Mc Carthy et al in a case control study including 275 women presenting in the emergency department with a complain of reduced fetal movements, compared them with a control group consisting of 265 women with no complain of RFM. They found an incidence of 1,5% stillbirth and an incidence of 10.6% of NICU admission in the group of women with RFM compared to 7,2% in the control group of pregnancies.

CONCLUSION

Maternal perception of fetal movement is defined as a mother's way of knowing about fetal well-being which including manual couting of fetal movement. Early identification of decreased fetal movement and early admission to antenatal care unit would help a lot in reducing the neonatal and perinatal mortality and morbidity ratio. In the present study, it was found that those pregnant women in their third trimester of pregnancy evaluated on basis of decreased fetal movement had some identifiable causes and was associated with poor perinatal outcomes in terms of low APGAR score and NICU admission. Cardiff count to ten methods is subjective way and when it is followed by USG and CTG findings can be used as reliable screening method for diagnosing women with high risk pregnancies. Hence, the authors recommend this to be used as a part of routine antenatal care as this will help in proper risk stratification of pregnant women and provide them with proper antenatal care and can help in reducing the poor perinatal and neonatal outcome.

Compliance: With ethical standards

Conflict of interest: The authors declare that they have no conflict of interest

Ethical Statement: The study has been approved by animal and human rights. This study doesn't involve any research work involving animals and was performed on booked antenatal patients.

Informed consent: informed consent has been obtained from all the participants prior to study.

Table-1: Association between Cases and Controls and Age Group (n = 234)

Age Group	Group			Fisher's Exact Test	
	Case	Control	Total	$\chi 2$	P Value
18-25 Years	51 (43.6%)	38 (32.5%)	89 (38.0%)	7.183	0.061
26-30 Years	44 (37.6%)	64 (54.7%)	108 (46.2%)		
31-35 Years	19 (16.2%)	12 (10.3%)	31 (13.2%)		
36-40 Years	3 (2.6%)	3 (2.6%)	6 (2.6%)		
Total	117 (100.0%)	117 (100.0%)	234 (100.0%)		

Table-2: Association between Case and Control Group and Para (n = 234)

Para	Group			Fisher's Exact Test	
	Case	Control	Total	χ2	P Value
P0	86 (73.5%)	81 (69.2%)	167 (71.4%)	3.012	0.447
P1	22 (18.8%)	26 (22.2%)	48 (20.5%)		
P2	7 (6.0%)	10 (8.5%)	17 (7.3%)		
P3	2 (1.7%)	0 (0.0%)	2 (0.9%)		
Total	117 (100.0%)	117 (100.0%)	234 (100.0%)		

Table-3: Association Between case and control Group and USG: Amniotic Fluid Index (n = 234)

USG: Amniotic Fluid Index	Group			Fisher's Exact Test	
	Case	Control	Total	χ2	P Value
Normal	97 (82.9%)	106 (90.6%)	203 (86.8%)	3.029	0.202
Oligohydramnios	15 (12.8%)	8 (6.8%)	23 (9.8%)		
Polyhydroamnios	5 (4.3%)	3 (2.6%)	8 (3.4%)		
Total	117 (100.0%)	117 (100.0%)	234 (100.0%)		

Table-4: Association Between Group and USG: Placenta Location (n = 234)

USG: Placenta Location	Group			Chi-Squared Test	
	Case	Control	Total	χ2	P Value
Anterior Upper	44 (37.6%)	28 (23.9%)	72 (30.8%)	47.376	<0.001
Fundal	46 (39.3%)	20 (17.1%)	66 (28.2%)		
Posterior	17 (14.5%)	37 (31.6%)	54 (23.1%)		
Posterior Upper	2 (1.7%)	27 (23.1%)	29 (12.4%)		
Anterior Low Lying	5 (4.3%)	2 (1.7%)	7 (3.0%)		
Anterior	1 (0.9%)	2 (1.7%)	3 (1.3%)		
Placenta Previa	2 (1.7%)	0 (0.0%)	2 (0.9%)		
Central Placenta	0 (0.0%)	1 (0.9%)	1 (0.4%)		
Total	117 (100.0%)	117 (100.0%)	234 (100.0%)		

Table-5: Association Between case and control Group and Induction of Labor (n = 234)

Induction of Labor	Group			Chi-Squared Test	
	Case	Control	Total	χ2	P Value
Yes	56 (47.9%)	32 (27.4%)	88 (37.6%)	10.491	0.001
No	61 (52.1%)	85 (72.6%)	146 (62.4%)		
Total	117 (100.0%)	117 (100.0%)	234 (100.0%)		

Table-6: Association Between case and control Group and NICU Admission (n = 228)

NICU Admission	Group			Chi-Squared Test	
	Case	Control	Total	χ2	P Value
Yes	16 (14.2%)	8 (7.0%)	24 (10.5%)	3.140	0.076
No	97 (85.8%)	107 (93.0%)	204 (89.5%)		
Total	113 (100.0%)	115 (100.0%)	228 (100.0%)		

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