

A Prospective Observational Study of Maternal Perception of Reduced Fetal Movements and Fetal Outcome

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Abstract

Background: Maternal perception of reduced fetal movements (RFM) is associated with increased risk of still birth, preterm labor & fetal growth restriction. RFM is thought to represent fetal compensation to conserve energy due to insufficient oxygen & nutrient transfer resulting from placental insufficiency. Intrauterine fetal death is preceded by RFM for 24 hours in up to 50% cases. In infants who are alive at presentation, RFM is associated with increased incidence of still birth, fetal growth restriction & feto-maternal hemorrhage. However RFM is may also occur in non pathological conditions such as anterior placental site, increased maternal activity & standing position. Inadequate clinician response to complaint of RFM is important contributory factor to still birth.

Aims and objectives: To assess association between maternal perceptions of reduced fetal movements and fetal outcome.

Methodology: Study was conducted in Department of Obstetrics and Gynecology at Bharati hospital, Pune. It was a prospective observational study of fetal outcomes in mothers perceiving reduced fetal movements. Women after 28 weeks of pregnancy presenting with reduced fetal movements out of that 202 pregnant women were included. Study was conducted from October 2020 to October 2022.

Results: Majority of the fetuses were healthy. There was strong association between reduced fetal movements and Oligohydramnios. We found significant association between NICU admission, birth weight, APGAR, and RFM category, while no significant association between RFM category and status at birth and type of delivery. There were 2 IUD's noted.

Conclusion: Fetal movements monitoring is necessary during antenatal period, after 28 weeks of pregnancy, it is a good predictor of fetal outcome, and helps in timely intervention.

Keywords: Reduced fetal movements; Oligohydramnios.

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INTRODUCTION

One of the most frequent negative pregnancy outcomes is a still birth.¹ Still birth rates have been reported to reach 100 per 1000 in some areas, far higher than rates in developed nations.² The majority of stillbirths at or after 24 weeks of gestation occurred in women without known risk factors in the first trimester, accounting for 86 percent of all still births.³

Fetal movements that quicken and gradually get stronger, more frequent, and more fluid as pregnancy goes along indicate that the foetus is developing normally and is doing well. Normal foetal anatomy, cardiovascular, and neurological function are expressed in foetal movements.⁴ A decrease or alteration in foetal movements may be a sign that the pregnancy will end poorly. Fetal movements are subjectively perceived. By 18 to 20 weeks of pregnancy, the majority of women become aware of foetal movements, which they may feel as "a discrete kick, flutter, swish, or roll."⁵ Fetuses with structural abnormalities and anencephalic foetuses have both been shown to move abnormally.

RFM, however, can also happen under non-pathological circumstances like an anterior placenta, increased maternal activity, and standing. A significant contributing factor to stillbirth is an inadequate clinician response to the complaint of RFM. The purpose of this study was to examine the pregnancy outcomes of women carrying singletons who presented to a tertiary care hospital in Pune, Maharashtra, in the third trimester with RFM.

MATERIALS AND METHODS

Study was conducted in Department of Obstetrics and Gynecology at Bharati hospital, Pune. It was a prospective observational study of fetal outcomes in mothers perceiving reduced fetal movements.

Women after 28 weeks of pregnancy presenting with reduced fetal movements out of that 202 pregnant women were included. Study was conducted from October 2020 to October 2022.

Inclusion Criteria

Pregnant women presenting with RFM after 28 weeks of gestation were enrolled.

Exclusion Criteria

This includes mothers with multi fetal pregnancy.

Tools of data collection

Data was collected by interviewing the participants in detail. Detailed history in respect to menstrual cycles, gestational age was ascertained and correlated clinically. Obstetrics history, past medical and surgical history and demographic profile were noted down.

MATERIALS

Demographic factors, clinical history recording,

USG to assess fetal biometry, liquor volume & umbilical artery Doppler was done. NST was also recorded.

METHODOLOGY

After taking a detailed history, physical examination, confirmed singleton pregnancy by dating scan and after consent, women presenting with RFM after 28 weeks of pregnancy:

Fetal Heart was auscultate with handheld doppler.

NST was done to exclude imminent fetal compromise, if suspicious or pathological fetal heart rate pattern is present, USG was done.

USG to assess fetal heart activity, fetal biometry, liquor volume & umbilical artery Doppler was done.

If any abnormality was detected on scan, the women was admitted for further management after counseling her about the condition.

She was managed as per the USG and NST finding.

Perinatal outcomes were noted.

If FHS was present on auscultation with handheld doppler and NST shows normal fetal heart rate pattern, her perception of RFM was resolved and there were no risk factors for FGR & still birth. We reassured the patient, and advise her to lie down properly focus on the FM for 1 hour, 3 times in a day (i.e. after breakfast, after lunch and after dinner).

If she does not feel 10 or more than 10 movements in 12 hours or 3 or more than 3 movements in 1 hour she should contact the doctor.

OBSERVATIONS AND RESULTS

The present study was conducted with the aim to assess association between maternal perceptions of reduced fetal movements and fetal outcome. A total of 202 pregnant women after 28 weeks of pregnancy presenting with reduced fetal movements were included in the study. The mean age of the patients was 28.07 ± 5.19 years, ranging between 20 to 39 years. The mean gestational age was 36.77 ± 3.50 weeks, and mean of duration reduced fetal movement (RFM) in hours was 5.36 ± 2.25 hours. The results of demographic parameters are shown in table 1. The clinical findings in mother with reduced fetal movements including pulse,

Table 1: Demographic parameters

		Mean	SD
Demographic characteristics	Age	28.07	5.19
	GA	36.77	3.5
	RFM since (hours)	5.36	2.25
Clinical parameters of mother and fetus	Pulse	90.01	7.75
	SBP	114.8	13.49
	DBP	75.6	11.25
	Wight of baby in kg	3.06	0.21
	APGAR 1 min	6.62	1.5
CTG	Equivocal	19	9.4
	FHS Absent	3	1.5
	FHS Present	25	12.4
	Non-Reactive	19	9.4
	Reassuring	136	67.3
Comorbidity	DM	15	7.4
	HTN	11	5.4
	Pre-eclampsia	25	12.4
	Hypothyroidism	13	6.4
	GDM	36	17.8
	Oligohydramnios	49	24.3
	delivery type	Cesarean	129
	Normal	73	36.14
live/ still birth	IUD	2	0.99%
	NICU admission	63	31.2
	Intranatal deaths	4	1.98%
Fetal outcomes	Healthy	165	81.68
	Respiratory Distress	19	9.41
	Tachypnoea	5	2.48
	Fresh still birth	4	1.98
	Grumping	4	1.98
	IUD	2	0.99
	Meconium Aspiration Syndrome	2	0.99
	Hypoxia	1	0.5

SBP, DBP and fetal characteristics including weight in Kg, APGAR at 1 min, APGAR at 5 min are shown in table 2.

Table 2: APGAR

			RFM category		p value
			>5 hrs	≤5hrs	
Comorbidities	DM	No	91	96	0.7927
		Yes	8	7	
	HTN	No	91	100	0.1286
		Yes	8	3	
	Pre eclampsia	No	88	90	0.8292
		Yes	11	13	

Table cont....

Comorbidities	Hypothyroidism	No	89	100	0.046
		Yes	10	3	
	GDM	No	80	87	0.578
		Yes	19	16	
Oligohydrominos	No	86	67	0.0003	
	Yes	13	36		
Association of RFM with status of fetus at birth	Status at birth	IUD	2	0	0.2388
		LIVE	96	102	
	NICU admission	No	60	78	0.0294*
		Yes	38	24	
	Type of delivery	Cesarean	57	72	0.0936
		Normal	42	31	

The fetal heart sound was detected in all pregnant women using Cardiotocography (CTG), the outcomes are shown in table 3.

RFM category	Weight of baby (Kgs)		p value
	Mean	SD	
>5	3.01	0.24	<0.0001*
≤5	3.16	0.1	

In majority of the cases the NST was reassuring (67.3%), followed by 12.4% with fetal heart sound present (NST not done), 9.4% each with equivocal and non-reactive CTG. While there were 2 (0.9%) of

cases where fetal heart sound was absent.

The presence of co-morbidities among all pregnant women were recorded and indicated in table 4 and presented graphically.

	RFM Category				P value
	>5		≤5		
	Mean	SD	Mean	SD	
APGAR 1 min	6.24	1.49	6.99	1.43	0.0003
APGAR 5 min	7.89	1.94	8.44	1.18	0.042

Majority (24.3%) of pregnant where having oligohydramnios. Most 36 (17.8%) of women with reduced fetal movement had GDM, followed by pre eclampsia (12.4%), diabetes mellitus (7.4%), hypothyroidism (6.4%) and hypertension (45.4%). Type of delivery.

The fetal status of live or still birth, and if NICU admission required is presented graphically and also in table 6. There were only 2 intrauterine deaths reported and 4 intranatal deaths in present study. While, in a total of 63 (31.2%) of newborn required NICU admission.

The distribution of fetal outcome among the included study population were recorded and shown in table 7, also presented graphically. Majority (163 (81.68%)) of the fetuses were healthy.

Among the adverse outcomes respiratory distress syndrome was most prevalent present in 19 (9.41%) of babies, followed by 5 (2.48%) with tachypnoea, grumping in 4 (1.98%), meconium aspiration syndrome was reported in 2 (0.99%) and there was only 1 (0.50%) fetus with hypoxia. As discussed above the IUD was reported in 2 (0.99%), and there were 4 (1.98%) fetuses with fresh still birth (whose FHS was present on admission).

The patients were categorized as per the RFM category and the association of co-morbidities in mother was evaluated by using Chi-square test. There was a significant ($p=0.0003$) association between the presence of oligohydrominos and RFM, there were significantly higher number of mothers with oligohydrominos with fetal movement ≤5

hours, compared to >5 hours.

We tried to find the association between the rate of IUD or live birth of fetus, NICU admission and type of delivery with RFM, we found significant association between NICU admission and RFM category. There was no significant association between RFM category and status at birth ($p=0.2388$) and type of delivery ($p=0.0936$). The distribution of fetal status at birth, NICU admission and type of delivery with RFM category.

There was a significant ($p<0.0001$) association reported between RFM category with birth weight of the baby. The baby with RFM of ≤ 5 hours had significantly more weight at birth as compared to babies with RFM of >5 hours. The means of birth weight according to the RFM category.

The means of APGAR scores at 1 and 5 minute were calculated among the groups based on RFM category, and compared using student 't' test. There was significantly higher APGAR at 1 minute ($p=0.0003$) and at 5 minutes ($p=0.042$) among the patients with ≤ 5 RFM compared to patients with RFM of >5 hours.

DISCUSSION

The mother's perception of the fetus' movements is an important indicator of fetal health. Normal fetal activity suggests that the heart, lungs, muscles, bones, and nervous system are functioning normally.

Between 18 and 20 weeks of pregnancy, the mother first feels the baby move, and they soon develop a predictable pattern. The term "fetal movements" refers to any distinct kick, flutter, swish, or roll.⁷

A potentially significant clinical sign is a sharp decrease in fetal movement. Preterm birth, fetal distress, fetal growth restriction (FGR), small for gestational age (SGA), stillbirth, and neuro developmental impairment in offspring are all risk factors for decreased fetal movement presentations.^{6, 7-10}

The present study was conducted with the aim of assessing the association between maternal perceptions of reduced fetal movements and fetal outcome. A total of 202 pregnant women after 28 weeks of pregnancy who presented with reduced

fetal movements were included in the study.

SUMMARY AND CONCLUSION

Fetal movements monitoring is necessary during antenatal period, after 28 weeks of pregnancy, it is a good predictor of fetal outcome, and helps in timely intervention. All the mother's should be taught about the method of fetal movements counting, and to report to hospital is they perceive less movements.

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