

# Comparison of Fetomaternal Outcome of Decreased with Normal Fetal Movement at term Pregnancy

Aliza Bhattarai,<sup>1</sup> Ganesh Dangal,<sup>2</sup> Kabin Bhattachan<sup>2</sup>

<sup>1</sup>Paropakar Maternity and Women's Hospital, Kathmandu, Nepal, <sup>2</sup>Kathmandu Model Hospital, Bagbazar, Kathmandu, Nepal.

## ABSTRACT

**Background:** Maternal perception of fetal movement is an important predictor of fetal wellbeing. Decreased perception of fetal movement by the mother is associated with increased maternal and fetal morbidity. The purpose of this study is to compare the fetomaternal outcome of decreased with normal fetal movement at term pregnancy.

**Methods:** A comparative study comprising 140 women, 70 cases of normal fetal movement and 70 cases of decreased fetal movement were taken and their fetal and maternal outcomes were compared in terms of maternal and fetal outcome.

**Results:** The group of females below 20 years old had a higher occurrence of decreased fetal movement 8.7% (n=6) compared to 1.4% (n=1) in the normal fetal movement group. The prevalence of risk factors were similar among both the groups. Induced deliveries were higher in the decreased fetal movement group, 27% (n=19) compared to 21.4% (n=15) in the normal fetal movement.

Caesarian section was more in the decreased fetal movement 54.3% (n=38) compared to 27.1% (n=19) in the normal fetal movement group which is statistically significant. The most common indication of caesarian section was non reassuring cardiotocography which comprised of 15.7%(n=11). Incidence of postpartum hemorrhage was higher in the decreased fetal movement (11.4%,n=8) then normal fetal movement (2.9%,n=2).

**Conclusions:** Decreased fetal movement in comparison to normal fetal movement has increased operative intervention most common indication being non reassuring cardiotocography. Incidence of post partum hemorrhage was higher in the decreased fetal movement group. Fetal outcomes were similar in both groups.

**Keywords:** Caesarian Section; decreased fetal movement; fetal outcome; maternal outcome; normal fetal movement.

## INTRODUCTION

Normal fetal movements can be defined as 10 or more fetal movements in 2 hours which may be perceived as 'any discrete kick, flutter, swish or roll'.<sup>1</sup> In Cardiff Count-to-Ten chart patient records fetal movements during the course of usual daily activity. A period of 12 hours without at least 10 perceived movements is considered a warning signal.<sup>2</sup> The majority of pregnant women report fetal movements by 20 weeks of gestation.<sup>3</sup> Multiparous can feel the movements from 16 weeks of gestation.<sup>4</sup> The incidence of decreased fetal movement is 5%.<sup>5</sup> Multiple factors can decrease

perception of movement like early gestation, reduced amniotic fluid, fetal sleep, obesity and anterior placenta.<sup>5</sup> Alcohol and cigarette smoking can transiently suppress fetal movement.<sup>3</sup> Maternal reporting of less fetal movement is associated with stillbirth, small for gestational age, early term birth, operative birth.<sup>6</sup> Reduced fetal movements might be a sign of pregnancy complications like preterm birth, oligohydramnios and fetal growth restriction.<sup>7</sup> Decreased fetal movement is associated with meconium stained liquor, cord around neck, increased neonatal intensive care unit (NICU) stay of the baby, low apgar scores.<sup>8</sup> The purpose of this study is to compare fetomaternal outcome of decreased with normal fetal movement at term pregnancy.

**Correspondence:** Dr Aliza Bhattarai, Paropakar Maternity and Women's Hospital, Kathmandu, Nepal, Email : alizabhattarai00@gmail.com, Phone: +9779840513427

## METHODS

This descriptive study was conducted in the Paropakar Maternity and Women's Hospital in the year for a duration of three months (February 2023 to April 2023) Convenience sampling technique was applied. A sample size of 140 was calculated using formula  $n = (Z\alpha/2 + ZB)^2 * (p1(1-p1) + p2(1-p2)) / (p1-p2)^2$ , of which 70 cases of decreased fetal movement and 70 cases of normal fetal movement was taken. The prevalence of meconium stained liquor (MSL) was taken 40% in the decreased fetal movement group and 21% in the normal fetal movement group<sup>14</sup>. Woman presented at term pregnancy with decreased fetal movement admitted from the emergency room or outpatient department and equal number of women with normal fetal movement was taken. Women with diagnosed intra uterine fetal demise (IUID), previous caesarian section, diagnosed congenital anomaly and multifetal gestation were excluded. Approval from Institutional Review Board (IRB) was obtained and study was conducted at Paropakar Maternity and Women's Hospital (PMWH). Patients meeting the inclusion criteria was selected for the study and enrolled from emergency room (ER) and outpatient's department (OPD). Informed consent was taken. Brief history regarding age, gravidity, parity, gestational age, relevant medical and surgical history was taken. Patients were followed from admission till discharge and the proforma was filled taking all the relevant information including maternal smoking or any drugs intake. Cardiotocography (CTG) is found out to be reassuring or not. Ultrasound (USG) was done to find to location of placenta, cord around the neck, amniotic fluid index. Mode of delivery either normal vaginal, caesarian or instrumental delivery was recorded. Outcome of the fetus in terms of birthweight, meconium stained liquor (MSL), stillbirth if any, Apgar score at 5 min, need of NICU admission, duration of NICU stay was noted. All data collected entered in Microsoft Office Excel worksheet and statistical Analysis was done using Statistical Package for social science (SPSS) version 27. Feto-maternal outcome was compared between decreased and normal fetal movement. Quantitative variables such as maternal age, gestational age at delivery, and Apgar score summarized as mean and standard deviation. Qualitative variables including mode of delivery, presence of meconium stained liquor were presented as frequency and percentage. Comparative analysis

was done with Chi square test for categorical variable and independent t test for continuous variable. P value less than 0.05 was considered as significant.

## RESULTS

In this study, 54.3% (n=38) of decreased fetal movement group had caesarean delivery as compared to 27.1% (n=19) of normal fetal movement group. The significant findings of fetal outcome were cord around the neck in 17.1% (n=12) in decreased fetal movement group compared to 5.7% (n=4) in normal fetal movement group. In the normal fetal movement group, 22.9% (n=16) had NICU admission but in decreased fetal movement 12.8% (n=9) had NICU admission but the p value was not statistically significant. There was one in hospital mortality of neonate in the decreased fetal movement group and one in hospital mortality in the normal fetal movement group.

The most common indication of caesarean section was non reassuring cardiotocography in the decreased fetal movement group 15.7% (n=11). The incidence of post partum haemorrhage (PPH) was also more in the decreased fetal group 11.4% (n=8) as compared to 2.9% (n=2) in the normal fetal movement group. There was one case of surgical site infection in the decreased fetal movement group.

Table 1 presents the demographic characteristics of term pregnant females who experienced normal fetal movement and those who had decreased fetal movement during term pregnancy. The group of females below 20 years old had a higher occurrence of decreased fetal movement, with 6 cases (8.7%), compared to only 1 case (1.4%) in the normal fetal movement group. Lastly, females aged 35 years old and above had a higher incidence of decreased fetal movement, with 4 cases (5.7%) compared to 2 cases (2.9%) in the normal fetal movement group. However, there was no statistically significant difference between the two groups ( $p > 0.05$ ). Similarly, there was no statistically significant difference observed in terms of gestational age between the decreased and normal fetal movement groups ( $p > 0.05$ ). Primigravida were slightly higher in the decreased fetal movement group, with 40 (57.1%) cases compared to 36 (51.4%) cases in the normal fetal movement group.

Table 1. Comparison of DFM with NFM by age group.			
Demographic profile	Decreased fetal movement n(%)	Normal fetal movement, n(%)	P-value
<b>Age(years) of mother(Mean±SD)</b>	25.8±4.6	25.0±4.3	0.093
<20	6(8.7%)	1(1.4%)	
20-24	22(31.4%)	34(48.5%)	
25-29	30(44.9%)	23(32.8%)	
30-34	8(11.4%)	10(14.2%)	
≥35	4(5.7%)	2(2.9%)	
<b>Gestational age (Mean±SD)</b>	38.9±1.1	39.1±1.2	0.219
<b>Gravida</b>			0.497
Primi	40(57.1%)	36(51.4%)	
Multi	30(42.9%)	34(48.6%)	
<b>Risk Factors</b>			0.366
Oligohydramnios	4.3%	8.7%	
Gestational Hypertension	7.2%	0%	
Alcohol intake	7.2%	1.4%	
Polyhydramnios	2.9%	0%	
Pre eclampsia	1.4%	0%	

Table 2 displays the delivery outcomes of term pregnant females who experienced decreased fetal movement and those who had normal fetal movement. The rate of spontaneous vaginal deliveries was higher in the group with normal fetal movement, with 34 females (48.5%) compared to only 11 females (15.7%) in the decreased fetal movement group. Induced deliveries were more frequent in the decreased fetal movement group, with 19 females (27.1%) compared to 15 females (21.4%) in the normal fetal movement group. There was no significant difference between the two groups in terms of instrumental deliveries. Cesarean sections were more frequent in the decreased fetal movement group, with 38 females (54.3%) compared to only 19 females (27.1%) in the normal fetal movement group. The differences observed were statistically significant ( $p < 0.0001$ ). Spontaneous vaginal delivery was significantly lower in decreased fetal movement group. Caesarian section was significantly higher in DFM group. No significant difference in instrumental delivery and induced vaginal delivery

Table 2. Comparison of mode of delivery of DFM with NFM.			
Mode of Deliveries	Decreased fetal movement(%)	Normal fetal movement(%)	P value
Spontaneous	11(15.7%)	34(48.5%)	0.000053
Induced	19(27.1%)	15(21.4%)	0.55
Instrumental	2(2.9%)	2(2.8%)	1.000
Caesarian section	38(54.3%)	19(27.1%)	0.001839
Total	70	70	

Table 3 shows the maternal morbidity of pregnant female at term in two groups - those reporting decreased fetal movement and those with normal fetal movement. The incidence of postpartum hemorrhage was higher in the decreased fetal movement group (11.4%) than in the normal fetal movement group (2.9%). This difference was statistically significant with a p-value of less than 0.05. Similarly, the incidence of infection was higher in the

decreased fetal movement group (17.1%) than in the normal fetal movement group (5.7%), with a p-value of less than 0.05. The normal fetal movement group had only one case each of hypertension and urine retention (1.4%), but the difference was not statistically significant ( $p > 0.05$ ).

**Table 3. Comparison of DFM with NFM in terms of maternal morbidity.**

Maternal morbidity	Decreased fetal movement (%)	Normal fetal movement (%)	P-value
Postpartum Hemorrhage	8(11.4%)	2(2.9%)	0.049
UTI	0(0.0%)	1(1.4%)	0.316
Hypertension	0(0.0%)	1(1.4%)	0.316
Urine Retention	0(0.0%)	1(1.4%)	0.316
SSI	1(1.4%)	0(0.0%)	

Table 4 shows the fetal outcomes of term pregnancies in two groups, those with DFM and those with NFM. The incidence of meconium-stained liquor was 21.4% in NFM group compared to the DFM group (17.1%), but this difference was not statistically significant ( $p > 0.05$ ). The incidence of cord around the neck was higher in the decreased fetal movement group ( $n=12$ , 17.1%) compared to the normal fetal movement group ( $n=4$ , 5.7%), and this difference was statistically significant ( $p < 0.05$ ). For NICU admission of the neonates, 16 (22.9%) from the normal fetal movement group and 9 (12.8%) from the decreased fetal movement group were admitted to the NICU ward, but this difference was not statistically significant ( $p > 0.05$ ). Among the NICU-admitted neonates, sepsis was significantly higher in the decreased fetal movement group (8, 88.9%) compared to the normal fetal movement group ( $p < 0.05$ ). The incidence of birth asphyxia was higher in the NFM group (3, 18.8%) compared to the decreased fetal movement group (1, 11.1%).

**Table 4. Comparison of Fetal outcome of DFM with NFM.**

Fetal outcome	Decreased fetal movement (%)	Normal fetal movement 18.8(%)	P-value 0.28
Meconium-stained liquor	12(17.1%)	15(21.4%)	0.520
Small for gestational age	9(12.9%)	10(14.3%)	0.805
Cord round the neck	12(17.1%)	4(5.7%)	0.034
Birth Weight (grams)	3126.7±413.8	3075.3±366.2	0.172
<2500	4(5.7%)	1(1.4%)	
≥2500	66(94.3%)	69(98.6%)	
NICU admission	9(12.8%)	16(22.9%)	0.122
Sepsis	8(88%)	4(25.0%)	0.002
Asphyxia	1(11.1%)	3(18.8%)	1.000
Grunting	0(0.0%)	1(6.3%)	0.444
Jaundice	0(0.0%)	4(25.0%)	0.102
Respiratory Distress Syndrome(RDS)	0(0.0%)	2(12.5%)	0.269
Seizure	0(0.0%)	1(6.3%)	0.444
In hospital mortality	1(1.4%)	1(1.4%)	1.000

## DISCUSSION

Women presenting with decreased fetal movement, compared with those presenting without decreased fetal movement, were younger mean [SD] age, 30.4 years vs 31.5 years; more likely to be nulliparous 4845 women [54.9%] vs 42210 multiparous women according to a cohort study done in Australia from 2009 to 2019 published in the JAMA network.<sup>9</sup> In our study, we found similar distribution of age. The group of females below 20 years old had a higher occurrence of decreased fetal movement, with six cases (8.7%), compared to only one case (1.4%) in the

normal fetal movement group. Lastly, females aged 35 years old and above had a higher incidence of decreased fetal movement, with four cases (5.7%) compared to two cases (2.9%) in the normal fetal movement group. However, there was no statistically significant difference between the two groups ( $p>0.05$ )

In a retrospective cohort study done by Sterpu et al from 2016 to 2017, as a risk factor of DFM, small for gestational age infant had higher rate of adverse neonatal outcome (18.4%) compared to normal growth fetus which is dissimilar to our study. 10.2% of nulliparous women had poor neonatal outcome. Similar to our study, young maternal age less than 19 years had higher incidence of DFM (12%).<sup>10</sup> In prospective study done by Turner et al, gestational hypertension was prevalent in 6.4% with decreased fetal movement and in 6.6% without decreased fetal movement. Pre eclampsia present in 3% with decreased fetal movement and 3.6% without decreased fetal movement, gestational diabetes mellitus was present in 14% with decreased fetal movement and 10% without decreased fetal movement.<sup>10</sup>

Similar risk factors were prevalent in our study population as comparison to the normal fetal movement group. The normal fetal movement group had a higher proportion of females with oligohydramnios (8.7%) compared to the decreased fetal movement group (4.3%). Gestational hypertension (7.2%) was only present in the decreased fetal movement group. Females who consumed alcohol were found to be higher in the decreased fetal movement group (7.2%) compared to the normal fetal movement group (1.4%). Females with gestational diabetes mellitus (GDM) (5.8%) were higher in the normal fetal movement group compared to the decreased fetal movement group (4.3%). Polyhydramnios was present only in the decreased fetal movement group (2.9%). Premature rupture of membrane (PROM) was found to be higher among the decreased fetal movement group (2.9%) compared to the normal fetal movement group (1.4%). Pre-eclampsia were present only in the decreased fetal movement group (1.4% respectively).

In the study by Sterpu et al. it was found that 64.8% of the women presenting with DFM had spontaneous labor in contrast to 15% only in our study, 23.5% underwent an induction of labor similar to our study and 11.8% had elective CS before onset of labor which is dissimilar to our study with 54% caesarean section rate in DFM group. Sterpu et al found that women with repeated incidents of DFM had statistically significant higher incidence of induction of labor than women with a single episode of

DFM.<sup>10</sup>

The usefulness of decreased fetal movement in predicting perinatal outcomes is questionable, with most women who report decreased fetal movement in the third trimester having outcomes without complications.<sup>11</sup>

In the study of Nor Azli et al. women, who had a daily and structured approach to awareness of fetal movements, were more likely to have a caesarean section and an induction of labour as compared with women who used a non-structured method daily.<sup>12</sup>

In the McCarthy study, women in the DFM group were less likely to have a spontaneous onset of labour, and more likely to undergo an induction of labour than the control group. An increase in the incidence of CS has been also found, which was not very significant (32.6% to 29.8%).<sup>13</sup> This is dissimilar to our study with significant caesarean section rate.

In our study the rate of spontaneous vaginal deliveries was higher in the group with normal fetal movement, with 34 females (48.5%) compared to only 11 females (15.7%) in the decreased fetal movement group. Induced deliveries were more frequent in the decreased fetal movement group, with 19 females (27.1%) compared to 15 females (21.4%) in the normal fetal movement group. There was no significant difference between the two groups in terms of instrumental deliveries, with only 2 women (2.9%) in each group. Cesarean sections were more frequent in the decreased fetal movement group, with 38 females (54.3%) compared to only 19 females (27.1%) in the normal fetal movement group.

In a cohort study published in the Jama Network titled Evaluation of Pregnancy outcome among women with decreased fetal movement in 2021, 15% in the decreased fetal movement group had meconium stained liquor which is in contrast to our study (more in NFM group, 13.4% without decreased fetal movement had meconium stained liquor, 8.5% in the decreased fetal movement group had non reassuring fetal status, 5.5% without decreased fetal movement had non reassuring fetal status. 1.9% in the decreased fetal movement had 5 min apgar <7, 1.4% in the normal fetal movement had 5 min apgar <7.<sup>9</sup>

In our study significant findings of fetal outcome were cord around the neck in 17.1% in decreased fetal movement group compared to 5.7% in normal fetal movement group. For NICU admission of the neonates, 16 (22.9%) from the normal fetal movement group and

9 (12%) from the decreased fetal movement group were admitted to the NICU ward, but this difference was not statistically significant ( $p > 0.05$ ). Not much competitive retrospective study was found for comparison.

## CONCLUSIONS

Decreased fetal movement is associated with increased rate of caesarean section with increase in maternal morbidity. It is advised for increased fetomaternal surveillance to identify at risk cases and appropriate decision making to decrease the maternal and fetal morbidity and mortality.

## REFERENCES

- Daly LM, Gardener G, Bowring V, Burton W, Chadha Y, Ellwood D, Frøen F et al. Care of pregnant women with decreased fetal movements: Update of a clinical practice guideline for Australia and New Zealand. *Aust N Z J Obstet Gynaecol*. 2018 Aug;58(4):463-468. Available from: <https://www.racgp.org.au/afp/2014/november/decreased-fetal-movements-a-practical-approach-in>
- Bekiou A, Gourounti K. Reduced Fetal Movements and Perinatal Mortality. *Mater Socio-Medica*. 2020 Sep;32(3):227-34. [10.5455/msm.2020.32.227-234](https://doi.org/10.5455/msm.2020.32.227-234)
- Hofmeyr GJ, Novikova N. Management of reported decreased fetal movements for improving pregnancy outcomes. *Cochrane Database Syst Rev*. 2012 Apr 18;(4):CD009148. doi: <https://doi.org/10.1002/14651858.CD009148.pub2>
- Grant A, Elbourne D, Valentin L, Alexander S. Routine formal fetal movement counting and risk of antepartum late death in normally formed singletons. *Lancet*. 1989 Aug 12;2(8659):345-9. [\[PubMed\]](#)
- Franks Z, Nightingale R. Decreased fetal movements: a practical approach in a primary care setting. *Australia Family Physician*. 2014 Nov;43(11):782-5. PMID: 25393464.
- Temporal patterns in count-to-ten fetal movement charts and their associations with pregnancy characteristics: a prospective cohort study - *PubMed* . [cited 2022 Nov 13].
- The Definition and the Significance of Decreased Fetal Movements - Sadovsky - 1983 - *Acta Obstetrica et Gynecologica Scandinavica* - Wiley Online Library . [cited 2022 Oct 15].
- Kassaw A, Debie A, Geberu DM. Quality of Prenatal Care and Associated Factors among Pregnant Women at Public Health Facilities of Wogera District, Northwest Ethiopia. *J Pregnancy* . 2020 [cited 2022 Nov 13];2020. doi: <https://doi.org/10.1155/2020/9592124>
- Turner JM, Flenady V, Ellwood D, Coory M, Kumar S. Evaluation of Pregnancy Outcomes Among Women With Decreased Fetal Movements. *JAMA Netw Open*. 2021 Apr 8;4(4):e215071. doi: <https://doi.org/10.1001/jamanetworkopen.2021.5071>
- Sterpu I, Pilo C, Koistinen IS, Lindqvist PG, Gemzell-Danielsson K, Itzel EW. Risk factors for poor neonatal outcome in pregnancies with decreased fetal movements. *Acta Obstet Gynecol Scand*. 2020;99(8):1014-21. doi: <https://doi.org/10.1111/aogs.13827>
- Saastad E, Winje BA, Pedersen BS, Frøen JF. Fetal Movement Counting Improved Identification of Fetal Growth Restriction and Perinatal Outcomes - a Multi-Centre, Randomized, Controlled Trial. *PLOS ONE*. 2011 Dec 21;6(12):e28482. doi: <https://doi.org/10.1371/journal.pone.0028482>
- Nor Azlin MI, Maisarah AS, Rahana AR, Shafiee MN, Aqmar Suraya S, Abdul Karim AK, Jamil MA. Pregnancy outcomes with a primary complaint of perception of reduced fetal movements. *Journal of Obstetrics and Gynaecology*. 2015 Jan 2;35(1):13-5. doi: <https://doi.org/10.3109/01443615.2014.930108>
- McCarthy CM, Meaney S, O'Donoghue K. Perinatal outcomes of reduced fetal movements: a cohort study. *BMC pregnancy and childbirth*. 2016 Dec;16:1-6. [\[Article\]](#)
- Dhungana PR, Adhikari R, Pageni PR, Koirala A. Decreased fetal movement: Is it an alarm to Obstetrician and Pregnant Lady? *Med J Pokhara Acad Health Sci*. 2018 Dec31;1(2):92-7. doi: <https://doi.org/10.3126/mjphs.v1i2.23402>