

Maternal and Perinatal Outcome among Pregnant Women Presenting with Decreased Fetal Movements in Third TrimesterAkhila Rachel Raju¹, Anjali Prem², Sathi M.S³, Anitha K Gopal⁴¹Assistant Professor, Department of OBG, Mount Zion Medical College, Adoor, Pathanamthitta, Kerala²Assistant Professor, Department of OBG, Government Medical College, Kottayam, Kerala³Professor, Department of OBG, Government Medical College, Kottayam, Kerala⁴Professor, Department of OBG, Government Medical College, Kottayam, Kerala

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Conflict of interest: Nil

Abstract:

Background: Decreased fetal movement is one of the common complaints among the pregnant women presenting to emergency department. 55% of pregnancies with stillbirth gave history of decreased fetal movements prior to the diagnosis. It occurring on multiple occasions has increased risk of poor perinatal outcome. Hence early diagnosis of the cause for decreased fetal movements' helps to initiate intervention when the fetus is still compensated; thus prevents progression to fetal death.

Aims and Objectives of the Study: To estimate obstetric & perinatal outcomes of pregnant women presenting with decreased fetal movements in third trimester. To estimate obstetric & perinatal outcomes of pregnant women presenting with decreased fetal movements in third trimester.

Materials: A prospective descriptive hospital based study in 197 pregnant women who presented with decreased fetal movements in the third trimester to the labour room of Govt. Medical College, Kottayam during February 2021 to October 2021 were included after ensuring the inclusion and exclusion criteria. Then they were followed up until delivery to study the maternal & perinatal outcome.

Results: Among the 197 study subjects, 56.3% were Primigravida. 14.2% were presented with more than once with decreased fetal movements. The incidence was 12.2% with intrauterine fetal demise (IUD) at presentation. 77.15% were induced, 32% had caesarean section. Among the 173 live babies, 7.5% had APGAR < 7, 23.1% had fetal distress, 12.1% had perinatal asphyxia requiring resuscitation, 6.4% had meconium aspiration syndrome and 27.7% required admission in NICU. 27.9% were preterm and 16.2% had perinatal mortality.

Conclusions: Women presenting with reduced fetal movement are associated with poor perinatal outcomes like preterm birth, low APGAR score, perinatal asphyxia requiring resuscitation, respiratory distress, meconium aspiration syndrome, NICU admission and perinatal mortality and also an increased rate of cesarean section. The patients with obstetric and medical complications in the present or previous pregnancies; presenting with decreased perception of fetal movements for more than one time was associated with poor perinatal outcome.

Keywords: Reduced fetal movement, still birth, preterm birth, APGAR score, perinatal asphyxia requiring resuscitation, respiratory distress, meconium aspiration syndrome, NICU admission and cesarean section.

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Introduction

Decreased fetal movement is one of the common complaints among the pregnant women presenting to emergency department. It may be a harbinger of impending fetal death. [1] Studies have shown that growth restricted fetus was identified before birth significantly when fetal movement counting was used. It has been found out that 55% of pregnancies with stillbirth had history of decreased fetal movement prior to diagnosis. [2] So inadequate response to complaint of reduced fetal movements can be an important contributory factor for stillbirth. It has been suggested that reduced or absent fetal movements may be a warning sign of

impending fetal death. Maternal perception of fetal movement is one of the first signs of fetal life & fetal wellbeing. [3] Fetal movement is a subjective measurement & is mainly assessed by maternal perception. Fetal movements provide reassurance of the integrity of the central nervous and musculoskeletal systems. [4] The coordination of whole body movement requires complex neurologic control & it is similar to that of the newborn. Short-term observations of the fetus are best done by real-time ultrasound imaging. Monitoring fetal movement has been shown to be helpful in predicting impending death or

compromise, especially when placental insufficiency is longstanding. [5] Presence of a vigorous fetus is reassuring. A pregnant woman usually starts perceiving fetal movements between 18 to 20 weeks of gestation (although multigravida perceives movements at an earlier gestational age) & rapidly acquires a regular pattern.

Fetal movement is defined as any discrete kick, flutter, swish or roll. [6] Studies of fetal physiology using ultrasound show an association between maternal perception of decreased fetal movements & poor perinatal outcome. In the presence of fetal hypoxia & placental dysfunction, there will be decreased gross body movements of the fetus. It is an adaptive response to placental insufficiency & hypoxia to conserve oxygen.

Compensatory adaptation is by redistribution of blood flow to brain, heart & adrenals. In later stages, a sign of decompensation is warning for impending injury & death. Women presenting on multiple occasions with decreased fetal movements are at increased risk of poor perinatal outcomes, like fetal death, intrauterine growth restriction (IUGR) or preterm birth. A significant reduction or sudden alteration in fetal movement is a potentially important clinical sign.

Hence early recognition of decreased fetal movements makes it possible to initiate intervention at a stage when fetus is still compensated & thus prevent progression to fetal death. Some of the investigators have reported excellent correlation between maternal perception of fetal movements and movements documented by instrumentation. Proportion of fetal movements perceived by mother and documented during ultrasound monitoring at the same time ranges from 37% to 88%. [7] Some studies have shown that fetal movement count reduces perinatal mortality. [8] Hence fetal movement count has been used as a noninvasive method for assessing fetal wellbeing. Women are often taught by their health care provider to monitor or be aware of the movements of the fetus. Since decreased fetal movement can be a warning sign of potential fetal impairment or risk, it requires further evaluation.

Fetal movement counting is an easy method of fetal surveillance because most women can be taught to recognize & note their baby's movement. Most of the clinicians recommended that pregnant women should monitor fetal movements, especially by the third trimester. This can be achieved by simply instructing the woman to have a general awareness regarding the fetus and determine if the fetus is moving less than normal on any given day or same as other days. Alternatively, healthcare providers recommend a more formal fetal movement count (FMC), sometimes called a kick count. Often clinicians recommend starting this surveillance

around 28 weeks of gestation and continuing throughout the remainder of the pregnancy. If there is uncertainty regarding perceived decreased fetal movements after 28 weeks gestation, women should be advised to lie on their left lateral side and focus on fetal movements for 2 hours. If they do not feel 10 or more discrete movements in 2 hours they should contact their healthcare provider immediately. Maternal concern about decreased fetal movement warrants assessment.

Many studies have attempted to find out a correlation between decreased fetal movement and placental functioning, uterine abnormalities, fetal growth restriction, tight nuchal cords, or to demonstrate that fetal movement counting can prevent intrauterine fetal demise. Even though this type of monitoring is often recommended, it does not always prevent complications.

However, due to the low cost and potential benefit, it is recommended. Most of the women are unaware of daily fetal movement counting and hence educating them will help appropriate health care seeking behaviour. However it has been observed that hasty decision of termination of pregnancy leads to overburdening of neonatal services and neonatal morbidity because of prematurity. Hence it was necessary to know subset of women who are likely to have poor perinatal outcome.

Study Design: Prospective Descriptive Study

Study Setting: Department of Obstetrics and Gynaecology, Government Medical College, Kottayam, Kerala.

Study Period: 01 February 2021 to 31 October 2021

Study Population:

Antenatal women presenting with decreased fetal movements in third trimester to the labour room, Department of Obstetrics and Gynaecology, Government Medical College, Kottayam.

Inclusion Criteria:

Pregnant women aged more than 18 Years of age were included. Pregnant women with a gestational age more than 28 weeks were included. Pregnant women with Singleton pregnancies were included.

Exclusion Criteria:

Pregnant women diagnosed during antenatal examinations with congenital anomalies of fetuses were excluded. Pregnant women with multiple pregnancies were excluded.

Sample Size: Sample size was calculated based on article 'pregnancy outcomes of reduced fetal movement & its determinant factors' done by Habtambu, Animutt & Abenezer.60

Sample size = $4pq/d^2$

- P=proportion of babies of pregnant women with decreased fetal movements have preterm birth
- $q=100-p$
- $d=20\%$ of P
- $P=33.7$
- Sample size = $4 \times 33.7 \times 66.3 / (20\% \text{ of } 33.7)^2 = 197$

Sampling Method: Consecutive Sampling

Study Procedure: The study was conducted as a prospective descriptive hospital based case study in pregnant women who presented with decreased fetal movements in the third trimester to the labour room of Govt. Medical College, Kottayam. 197 pregnant women presented with decreased fetal movements to the labour room, Department of Obstetrics and Gynaecology during February 2021 to October 2021 were included in the study after ensuring the inclusion and exclusion criteria. After explaining the study and obtaining their written informed consent, a detailed history was taken and they were subjected to general examination, physical examination, systemic and obstetric examination at admission. Ultrasound was taken for assessing the growth, liquor, Doppler and Biophysical profile (BPP). Non-stress test (NST) was done on presentation. Then they will be followed up until delivery to study the maternal & perinatal outcome. Poor perinatal outcome was defined as one or all of the following: poor APGAR (score < 7), respiratory distress, perinatal asphyxia requiring interventions, meconium aspiration syndrome, NICU admission, perinatal mortality & preterm birth. Maternal outcomes are those who had spontaneous onset of labour, who required induction or who had a normal vaginal delivery, instrumental delivery or caesarean section.

Study Tool: Structured Proforma

Operational Definition: 1. Preterm and term – gestational age < 37 weeks is preterm and gestational age more than or equal to 37 weeks is term. 2. APGAR SCORE-It is a quick screening test to assess the health of newborn at 1 & 5 minutes after birth which includes appearance of baby (pink or blue), pulse rate, Grimace, activity & respiratory effort with a maximum score of 2 for each. Scores 7 & above generally considered as normal. It is a convenient way of determining whether infant needs prompt intervention to establish breathing. 3. Meconium stained amniotic fluid (MSAF) and meconium aspiration – in utero meconium passage results from fetal hypoxia. Meconium aspiration occurs due to the combination of MSAF and gasping by the fetus or newborn. 4. Intrauterine growth restriction (IUGR) - fetus with an estimated weight below 10th

percentile for given gestational age. 5. Macrosomia – birth weight equal to or more than 90th percentile for a given gestational age Perinatal mortality-deaths among the fetuses weighing 1000gm or more at birth (28 weeks of gestation) who die before or during delivery or within the first 7 days of delivery. 6. Stillbirth- birth of a newborn after 28th completed week (weighing 1000gm or more) when the baby does not breathe or show any signs of life after delivery. 7. NON STRESS TEST (NST) - Continuous monitoring of fetal heart rate is cardiotocography (CTG). NST is performed using an external CTG in the absence of contraction. It predicts fetal status for next 72 hours. Fetal heart rate patterns are described using basal fetal heart rate, baseline variability, presence of accelerations or decelerations. Accelerations are transient increase in basal heart rate by >15bpm, lasting for at least 15 seconds and is associated with fetal movements. Decelerations are significant if it decreases > 15 bpm below baseline, lasts for >15 seconds is repetitive. 8. BIOPHYSICAL PROFILE (BPP) - It consists of NST, fetal breathing movements, gross body movements, fetal tone & amniotic fluid volume assessed by ultrasound. Presence of these variables implies normal oxygenation of central nervous system. A score 10 or 8 with normal amniotic fluid volume is normal & it correlates with good outcome. 9. Oligohydramnios- reduced amniotic fluid (amniotic fluid index <5 or single deepest pocket <2). 10. Polyhydramnios – excessive volume of amniotic fluid (amniotic fluid index >25 or single deepest pocket >8). 11. Induction -initiation of uterine contractions by any method (medical, surgical or combined) for the purpose of vaginal delivery. 12. Augmentation – process of stimulation of uterine contractions that are already present but found to be inadequate. 13. Respiratory distress – characterized by tachypnea, grunting, nasal flaring and worsening saturation and its severity is assessed using Silverman- Andersen scoring and a score ≥ 5 shows higher the need of respiratory support.

Data Management and Analysis: Data collection is done by Dr. Akhila Rachel Raju (primary investigator) based on personal interview, examination and investigations using Proforma. Those pregnant women presenting with decreased fetal movements to emergency department of Obstetrics and Gynaecology, Medical College Hospital, Kottayam will be subjected to thorough obstetric examination and they were followed up till delivery and the maternal and neonatal outcome parameters are collected. Data were entered into M.S. Excel sheet and analysed using SPSS statistical software version 22. Quantitative variables were summarised using mean and standard deviation (SD). Categorical variables were represented using frequency and percentage. Independent sample t-test was used to test

statistical significance of difference between means of variables among two independent groups. Pearson Chi-square test and Fisher's Exact test were used for comparing categorical variables between groups. Pearson correlation test was used to find out correlation between different quantitative variables. A p value of <0.05 was considered statistically significant.

Observations and Results: 197 pregnant women presented with decreased fetal movements presented to the labour room in third trimester, Department of Obstetrics and Gynaecology during February 2021 to October 2021 were included in the study after ensuring the inclusion and exclusion criteria. After explaining the study and obtaining their written informed consent, these patients were

examined, CTG documented and Ultrasound was done. They were followed up till delivery and babies were followed up to assess their perinatal outcome.

Age Distribution: The present study population consisted of 197 pregnant women presented with complaints of decreased perception of fetal movements in third trimester. The youngest was 19 years old and the oldest was 42 years old. Their mean age was 27.34 years. Among 197 women, majority belongs to the age group 21 to 25 years 73 subjects (37.1%), 12 (6.1%) belongs to less than or equal to 20 years, 62 (31.5%) in the age group 26 to 30 years, 34 (17.3%) in 31 to 35 years age group and 16(8.1%) in > 35 years age group. (Fig 1)

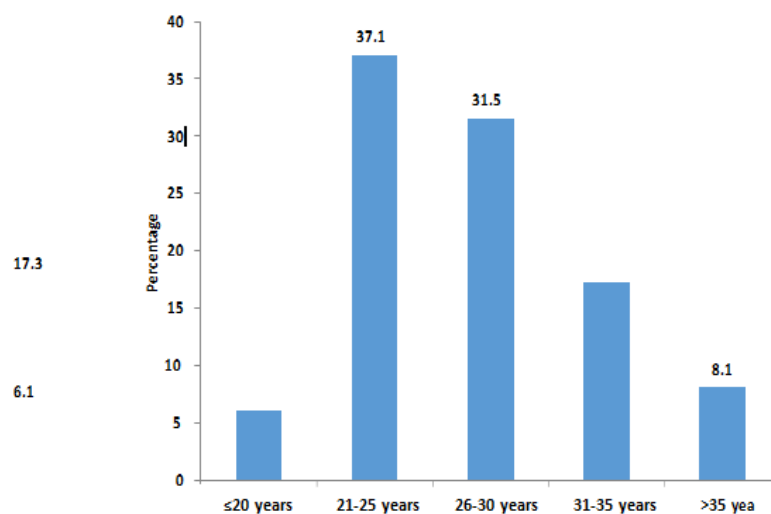


Figure 1: Age distribution of study population

Obstetric Score: Among the 197 pregnant women, majority were Primigravida 111 subjects (56.3%). 39 (19.8%) women were primipara, 31(15.7%) were nullipara and 16 (8.1%) were multipara. (Fig 2)

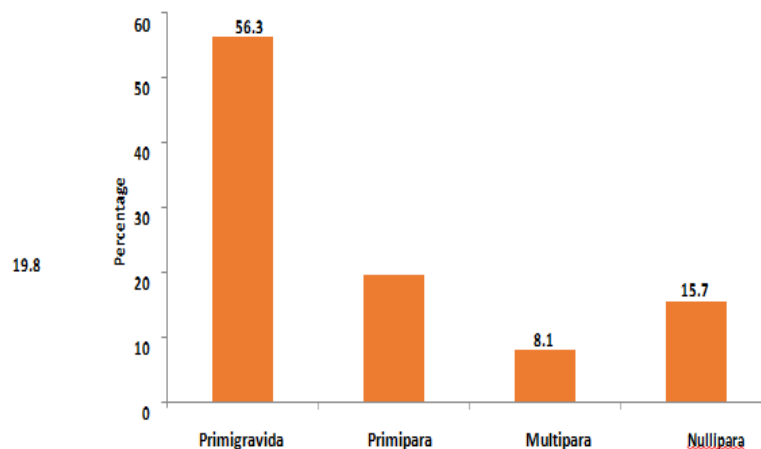


Figure 2: Obstetric score

Gestational Age: Among 197 women, majority were term patients (more than or equal to 37 weeks),

that is 136 women (69%). 31% were preterm of which 7.6% belongs to 28 to 34 weeks and 23.4% belongs to 34 to 37 weeks of gestation. The mean gestational age is 37 weeks. (Fig 3)

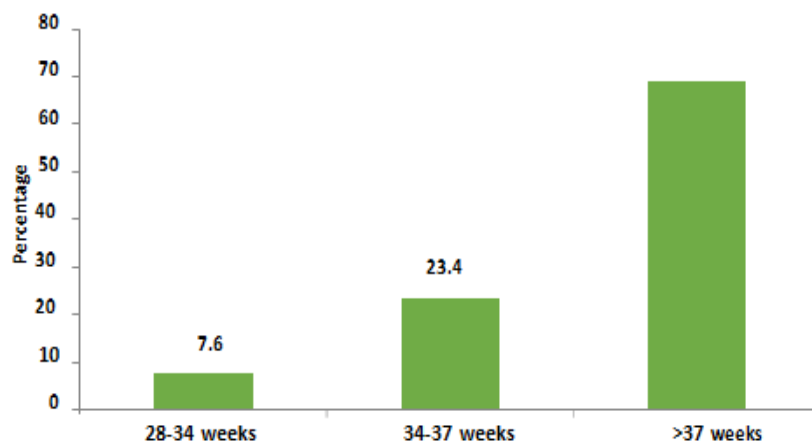


Figure 3: Gestational age

Obstetric Co-Morbidities: Among the 197 pregnant women selected in the study with decreased fetal movements, majority, 106 women were uncomplicated contributing to 53.8%. In rest of the patients, majority (50 women-25.4%) had Diabetes.

Among them, 20 (10.2%) women had Gestational Diabetes Mellitus on Medical Nutritional therapy (GDM on MNT), 16 (8.1%) had Gestational Diabetes Mellitus on oral hypoglycemic agents (GDM on OHA), 12 (6.1%) had Gestational

Diabetes Mellitus on Insulin (GDM on Insulin) and 2 (1%) had Overt Diabetes Mellitus on Insulin. 28(14.2%) women had Hypertensive disorder.

Among them, 15(7.6%) women had severe Preeclampsia and 13(6.6%) had Gestational Hypertension (GHTN). One patient (0.5) had both GDM on Inulin and GHTN. 11(5.6%) women had Hypothyroidism and one (0.5%) had Intrahepatic Cholestasis of pregnancy. (Fig 4)

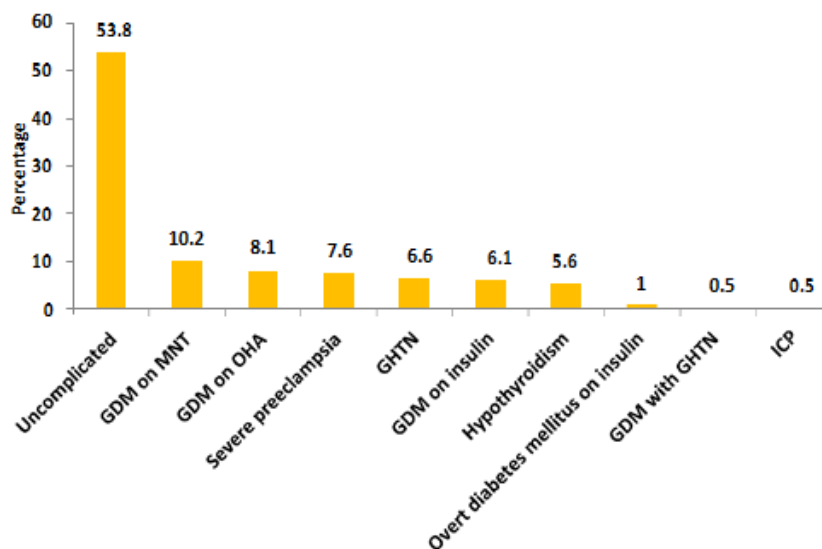


Figure 4: Obstetric Co- morbidities

Past Obstetric History:

Among the 197 women in the study, 111 were primigravida. Among the rest of 86 women, majority (38 women (44.2%)) were uncomplicated during their previous pregnancy. 33(38.3%)

women had history of abortion in their previous pregnancy of which 23(26.7%) women had one 1st Trimester abortion and 10(11.6%) had two 2nd Trimester abortion. 3(3.5%) women had history of intrauterine fetal death (IUD) in their previous pregnancy.

Hence, 15.1% of the total study subjects had Bad Obstetric history. 9(10.5%) were Diabetic in their previous pregnancy. 6(7%) women had GDM on

Insulin and 3(3.5%) had GDM on OHA. 3(3.5%) women had GHTN. (Fig 5)

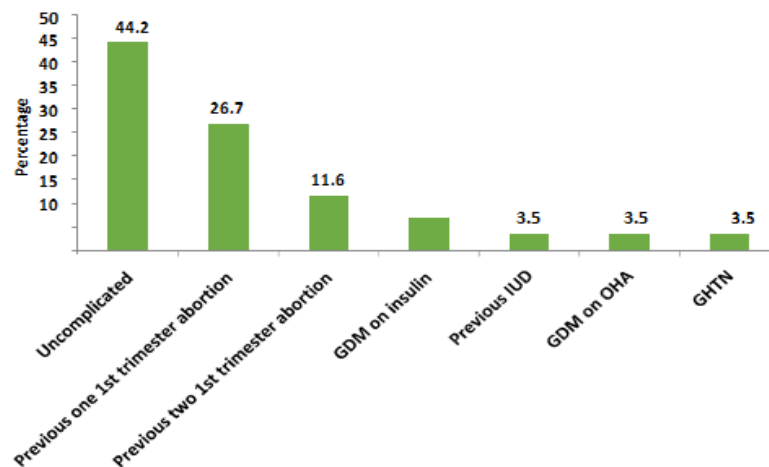


Figure 5: Past Obstetric history

12(21.8%) had previous caesarean section, 3 (0.5%) had previous vacuum delivery, 8 (14.5%) had previous preterm delivery and the rest (58.1%) had normal delivery among the total primipara and multipara in this study.

Whether Aware About Fetal Movement Counting Method: Among the 197 women, majority, (146 women (74.1%)) were aware about fetal movement counting method. However, 51(25.9%) women were unaware about the same. (Fig 6)

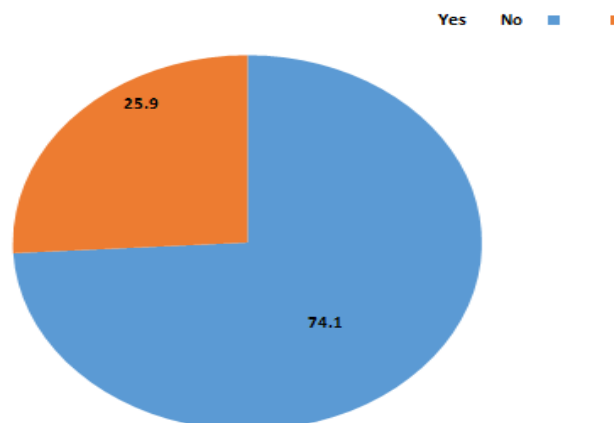


Figure 6: Awareness about fetal movement counting method

Whether Counselling Regarding Fetal Movement Counting Method during Antenatal Check-up (ANC): Among the 197 women, nearly two third, 132 women (67%) were counselled regarding fetal movement counting method during ANC while one third of them (65 women (33%)) were not counselled. (Fig 7)

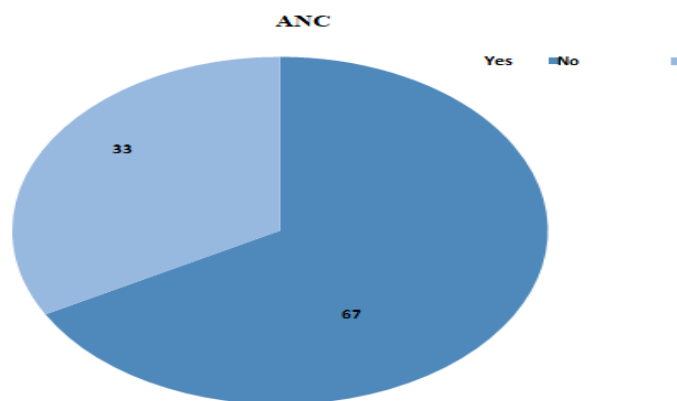


Figure 7: Whether counselled regarding fetal movement counting method during Whether Patient Had Decreased Fetal Movements For First Time Or Whether There Is Previous Episodes Of Similar Complaints: In this study majority of the women (85.8%) had first episode of decreased fetal movements (169 women) while 28 women (14.2%) had 2 or more episodes of reduced fetal movements. (Fig 8)

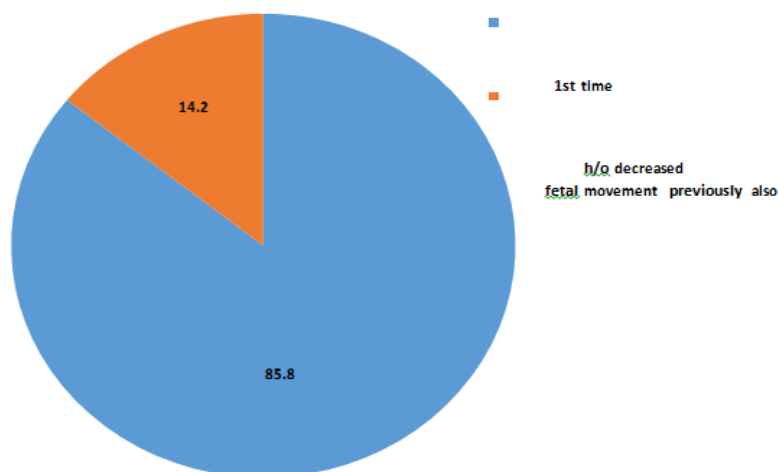


Figure 8: Whether patient had decreased fetal movements for first time or history of previous episodes

Body Mass Index (BMI): The BMI of 197 subjects were calculated and was categorized according to Asian standards of BMI and tabulated. The mean BMI was 23.64 Kg/m². Majority of the women were obese, 69 women (35%). Among them, 55(27.9%) belongs to obese class 1 and 14(7.1%) were in obese class 2 group. 44(22.3%) women had overweight. 20(10.2%) women had underweight. 64(32.5%) women had normal BMI. (Fig 9)

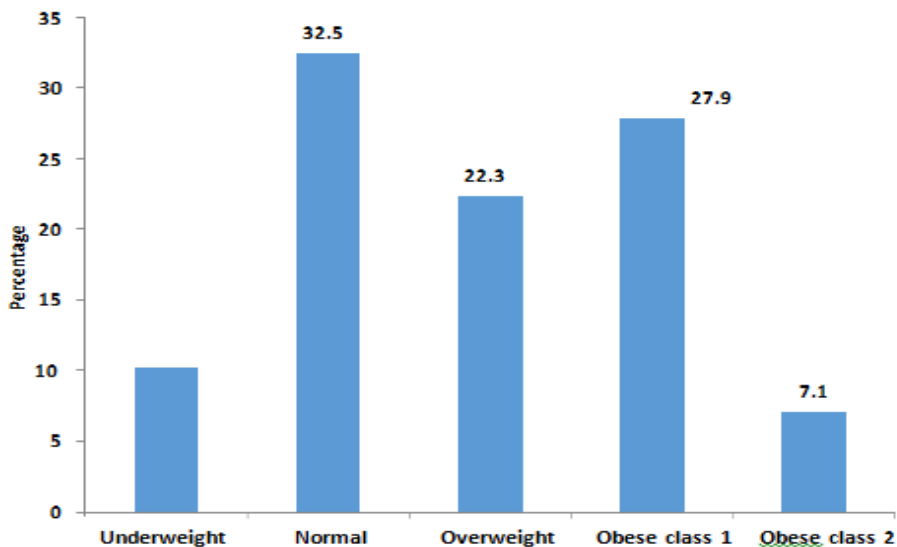


Figure 9: Body mass index (BMI)

Ultrasound Findings:

1) **Growth of the Fetus:** Among the 197 study subjects, 173 had live babies on presentation. Among them, majority, 120 babies (69.4%) had normal growth. 52(30.1%) babies had intrauterine growth restriction (IUGR) and one (0.6%) baby had macrosomia. (Fig 10)

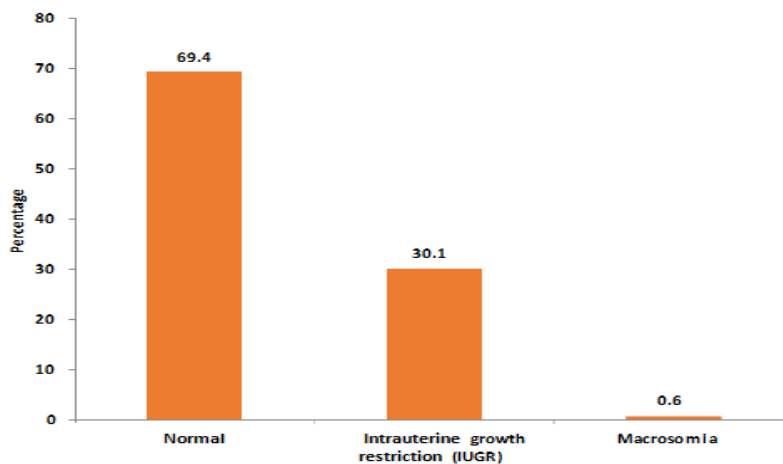


Figure 10: Growth of the Fetus

2) **Liquor Volume:** Among the 173 women with live fetuses on presentation, majority, 132 (76.3%) had normal liquor volume. 32(18.5%) women had oligohydramnios and 9(5.2%) had polyhydramnios. (Fig 11)

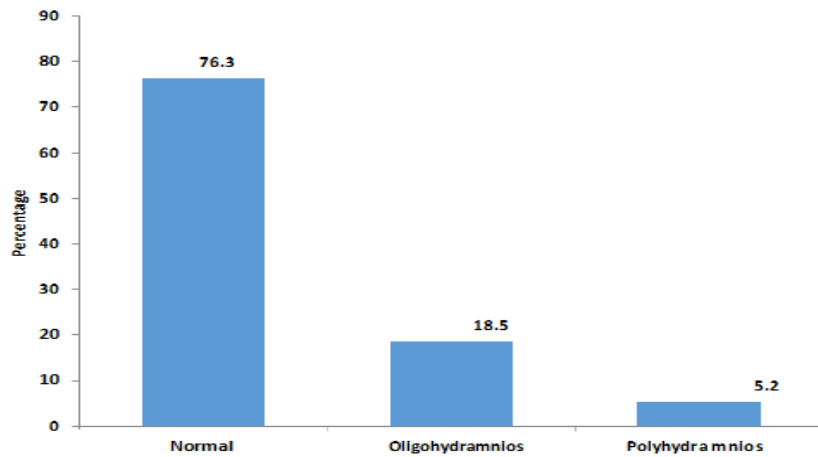


Figure 11: Liquor volume

3) **Doppler:** Among 173 women with live fetus at the time of presentation, majority, 155 women (89.6%) had normal Doppler. There were 8(4.6%) women with reversal of end diastolic flow in Umbilical artery, 5(2.9%) women had reduced diastolic flow in Umbilical artery and 5(2.9%) women had absent end diastolic flow in Umbilical artery. (Fig 12)

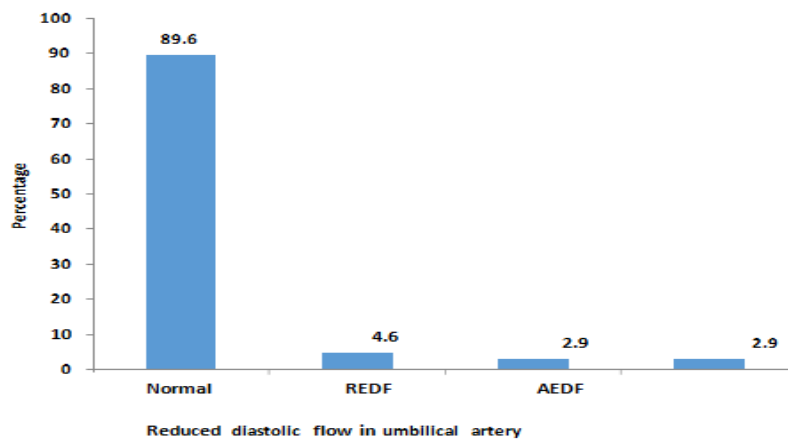


Figure 12: Doppler

4) **Biophysical Profile (BPP):** Among 173 women with live fetus at presentation with complaints of decreased fetal movements, majority, 168 women (97.1%) had a Biophysical profile (BPP) of more than or equal to 8; While 5(2.9%) women had BPP score <8. (Fig 13)

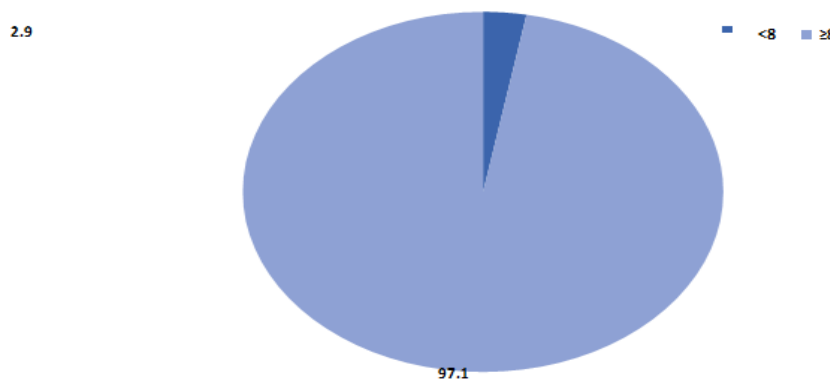


Figure 13: Biophysical profile score (BPP)

5) **Intrauterine Death (IUD):** Among the 197 women presented with complaints of decreased fetal movements, 24(12.2%) women had intrauterine death (IUD) at presentation. 173(87.8%) women had live babies at presentation with decreased fetal movements. **(Fig 14)**

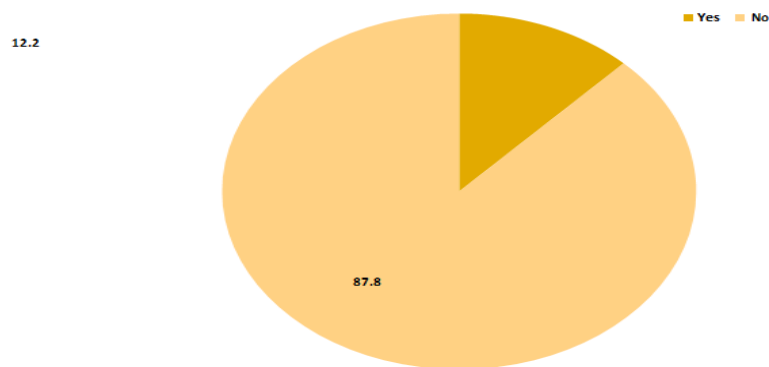


Figure 14: Intrauterine death (IUD)

Nonstress Test (NST): NST was taken for 173 pregnant women presented with complaints of decreased fetal movement who had live babies on presentation. Among them, 134(77.5%) women had reactive NST while 39(22.5%) had nonreactive NST. **(Fig 15)**

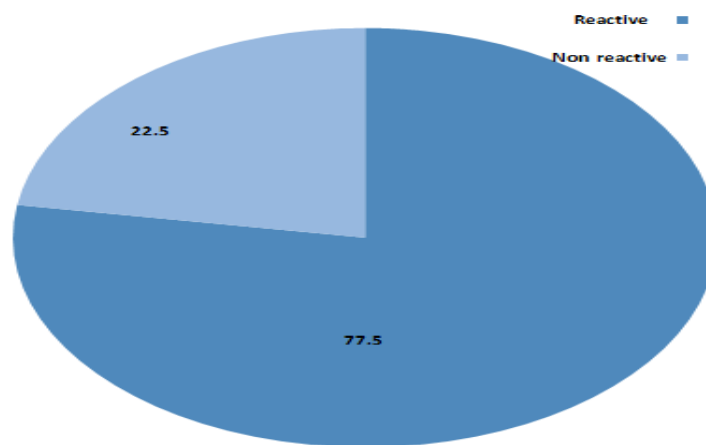


Figure 15: Non stress test (NST)

Onset of Labour: 13.7% (27 women) of the total subjects taken in the study had spontaneous onset of labour. 170 women (86.3%) were either induced or had caesarean section without induction. Among these 170 women, 152 were induced for various indication and 18 had direct caesarean section. **(Fig 16)**

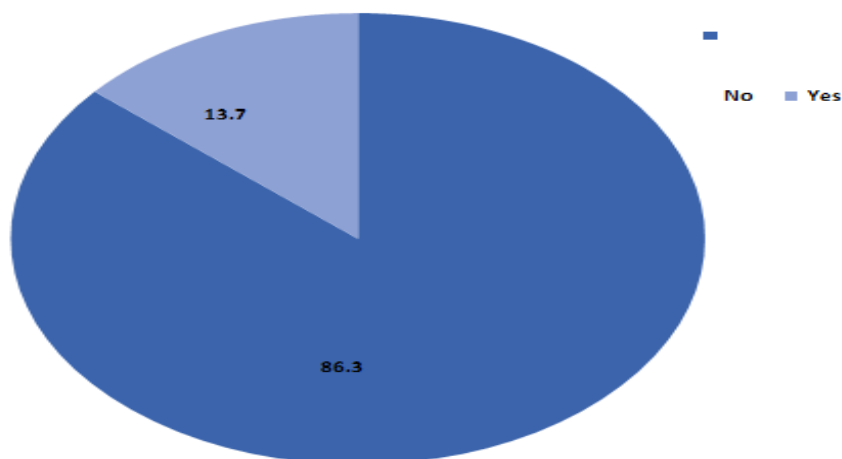


Figure 16: Spontaneous onset of labour

Indications for Induction

152 (77.15%) women in the study were induced for various reasons. The most common indication for induction was decreased fetal movement itself, in 57 women (37.5%). 18(11.8%) women were induced for term induction. 15(9.9%) were induced for IUD and another 15(9.9%) for IUGR. 5(3.3%) were induced for IUGR with oligamnios and another 5(3.3%) were induced for oligamnios and one (0.7%) for abnormal Doppler. 7(4.6%) women were induced for Hypertensive disorders,

among which 4(2.6%) had severe Preeclampsia and 3(2%) had GHTN.

Among the 11(6.6%) women induced for Diabetes, 4(2.6%) had GDM on OHA, 4(2.6%) had GDM on Insulin and 3(2%) had overt Diabetes mellitus on insulin. One women (0.7%) was induced for intrahepatic cholestasis of pregnancy (ICP), 2 women (1.3%) for Preterm premature rupture of membranes (PPROM) and one (0.7%) for premature rupture of membranes (PROM). (Fig 17)

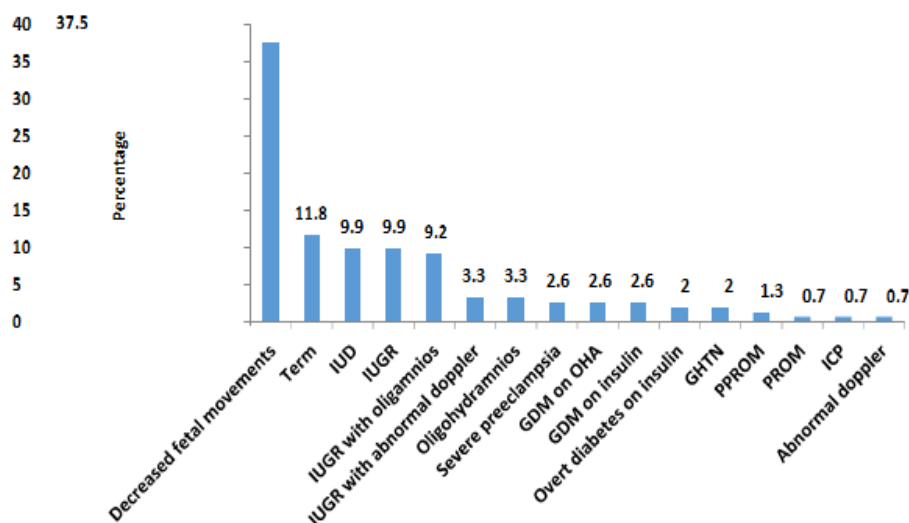


Figure 17: Indication for induction

Mode of Delivery: Majority of the women in the study (90 women (45.7%)) underwent Normal Labour. 63 women had caesarean section which accounts for 32%. There were 24(12.2%) IUD among the subjects, of which 17 (8.6%) were preterm IUD expulsion and 7(3.6%) were term IUD expulsion. There were 14(7.1%) preterm vaginal delivery and 6(3%) vacuum deliveries. (Fig 18)

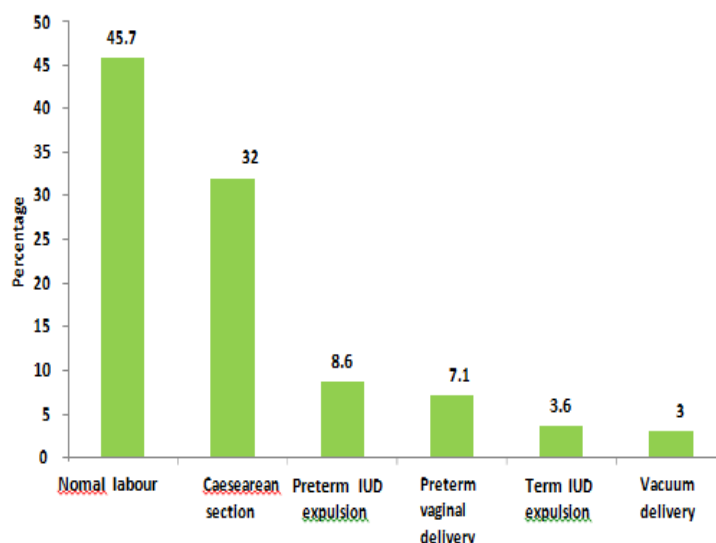


Figure 18: Mode of delivery

Indications for Caesarean Section: Among the 197 subjects included in the study, 63 women had

caesarean section which accounts for 32%. The most common indication for caesarean section was non reassuring fetal heart rate (NRFHR) in 19 women (30.2%).

In 10 women (15.9%) the indication was meconium stained amniotic fluid (MSAF) with unfavourable cervix. 10 women (15.9%) had Doppler abnormalities as the indication for caesarean section, of which 7(11.1%) had reversal of end diastolic flow (REDF) in umbilical artery and 3 (4.8%) had absent end diastolic flow

(AEDF). 7 (11.1%) women had persistent fetal bradycardia and 5 (7.9%) women had persistent variable deceleration as indication for caesarean section. Previous caesarean section with decreased fetal movements was the indication in 4(6.3%) women. 3 (4.8%) women had abruption, 2(3.2%) women had failed induction and in one (1.6%) women, there was failure to progress. Maternal pyrexia was the indication for one (1.6%) and placenta previa was the indication in another (1.6%) patient. (Fig 19)

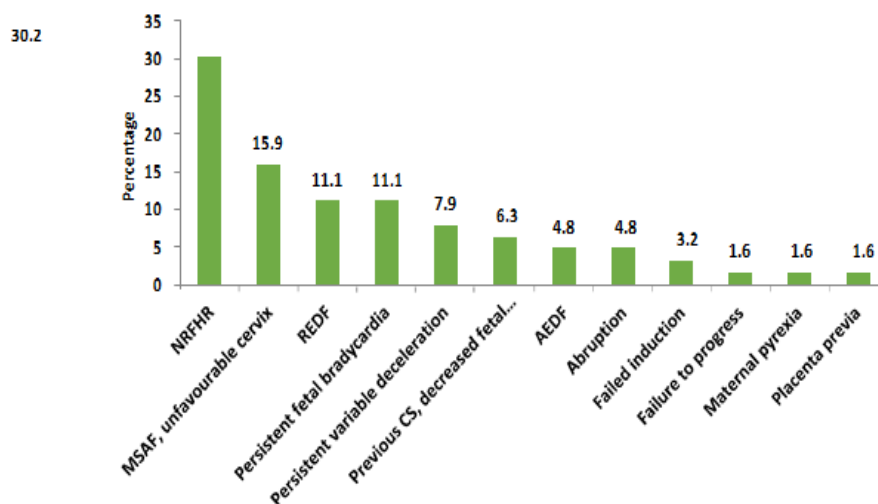


Figure 19: Indication for caesarean section

Colour of the Liquor: Majority of the babies (144 (73.1%)) had clear liquor. 24 (12.2%) had cola coloured liquor and 22 (11.2%) had meconium stained liquor. There was blood stained liquor (abruption) in 7(3.6%) women. (Fig 20)

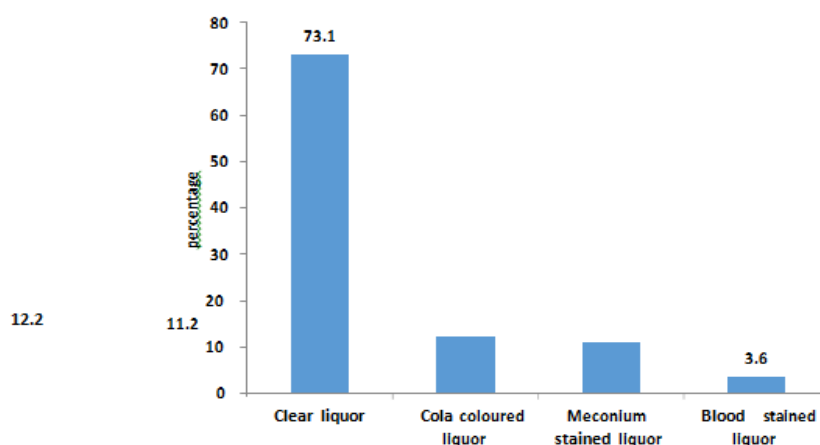


Figure 20: Colour of liquor

Cord around the Neck: 44 babies (22.3%) had cord around the neck while rest (77.7%) of the babies didn't have cord around the neck. (Fig 21)

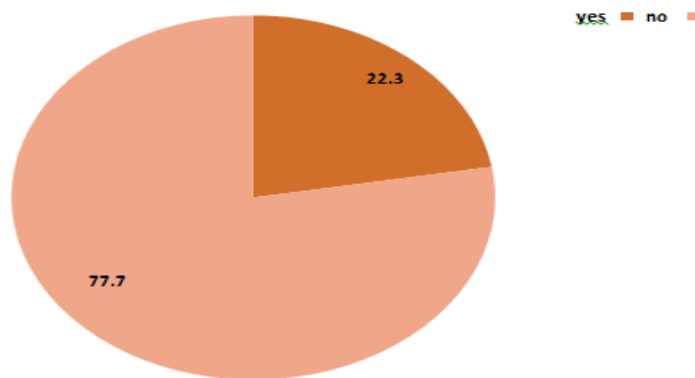


Figure 21: Cord around the neck

APGAR Score: Majority of the babies (160) had an APGAR score more than or equal to 7 in 81.2% while 13 (7.5%) babies had a score of <7. (Fig 22)

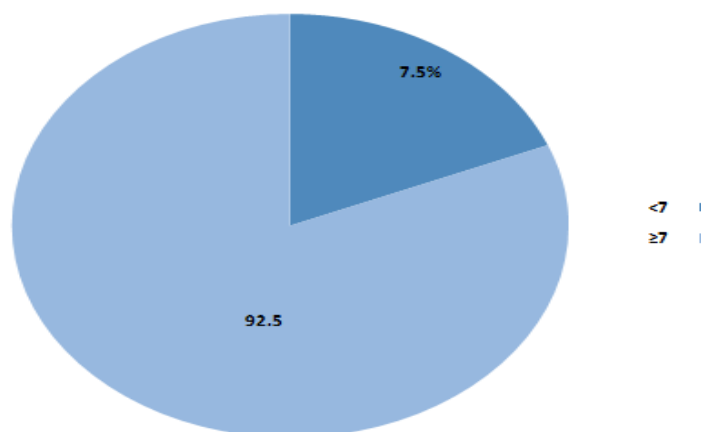


Figure 22: APGAR Score

Birth Weight of the Babies: The mean birth weight for the babies in the study was 2.5 kg. Majority of the babies (78) had their birth weight in the range of 1-2.49 kg which constitutes 39.6%. 71 (36%) babies were in the range of 2.5 to 3 kg. 44(22.3%) babies had their birth weight >3 kg. there were 4(2%) babies who had their birth weight < 1 kg. (Fig 23)

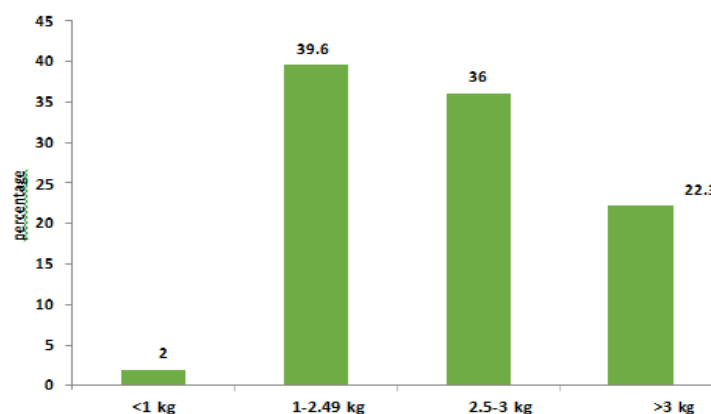


Figure 23: Birth weight of the babies

Respiratory Distress: 24 women among the total study subjects were diagnosed with intrauterine fetal death in their pregnancy on presentation. Among the remaining 173 women, 40 babies (23.1%) had respiratory distress. 133 (76.9%) babies had no respiratory distress. (Fig 24)

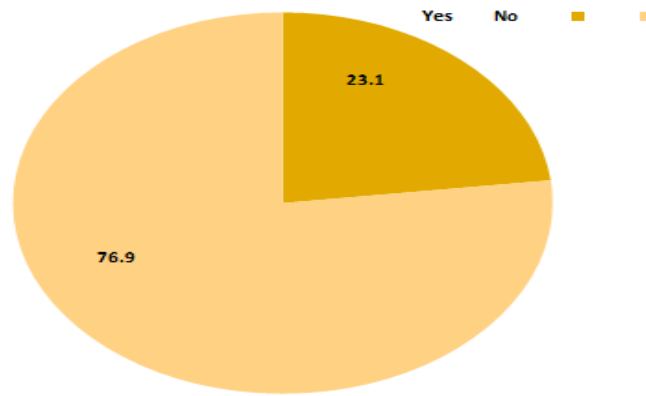


Figure 24: Respiratory Distress

Perinatal Asphyxia Requiring Resuscitation: Among 173 live babies, 21 (12.1%) babies had perinatal asphyxia requiring resuscitation while 152 (87.9%) were normal. (Fig 25)

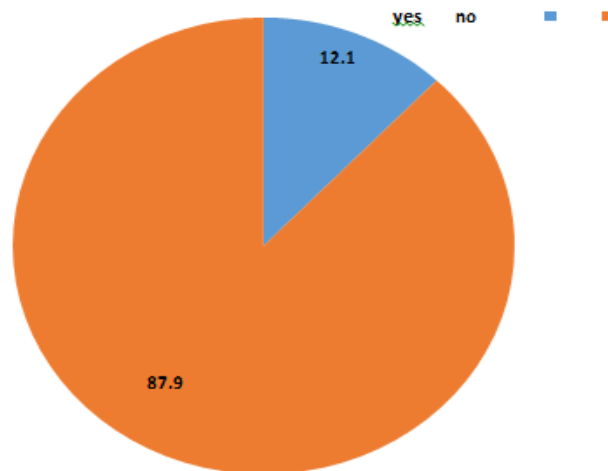


Figure 25: Perinatal asphyxia requiring resuscitation

Meconium Aspiration Syndrome: Among 173 babies, 11 (6.4%) babies had meconium aspiration syndrome and 162 (93.6%) were normal. (Fig 26)

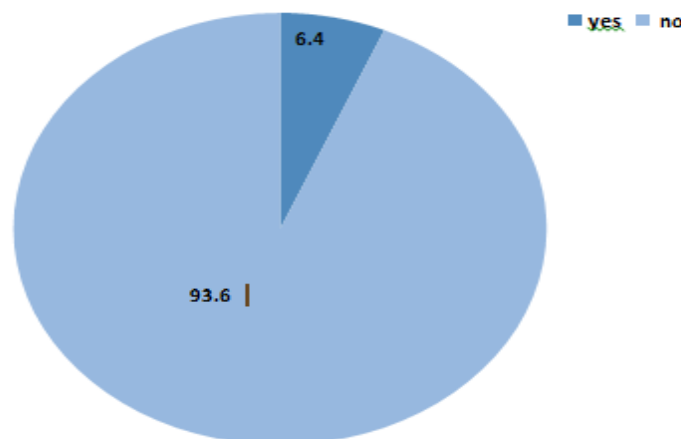


Figure 26: Meconium aspiration syndrome

NICU Admission: 27.7% (48 babies) required admission in NICU while rest of the 125 babies (72.3%) were not admitted. (Fig 27)

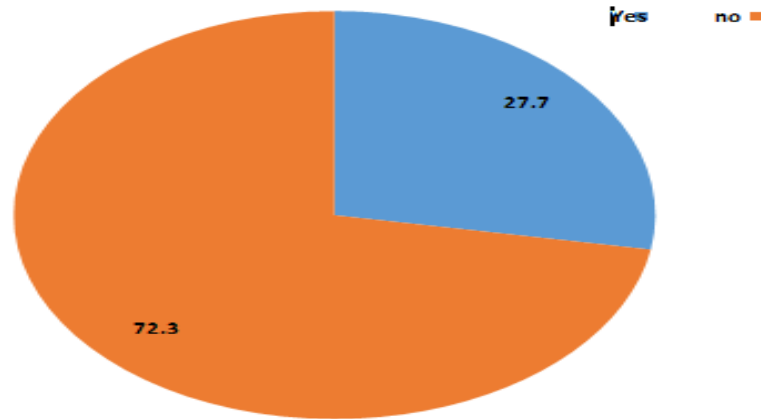


Figure 27: NICU admission

Perinatal Mortality: There was 16.2% (32 babies) perinatal mortality among the 197 babies born to the mothers taken in the study of which 24 were intrauterine fetal death. 165 babies (83.8%) were healthy. (Fig 28)

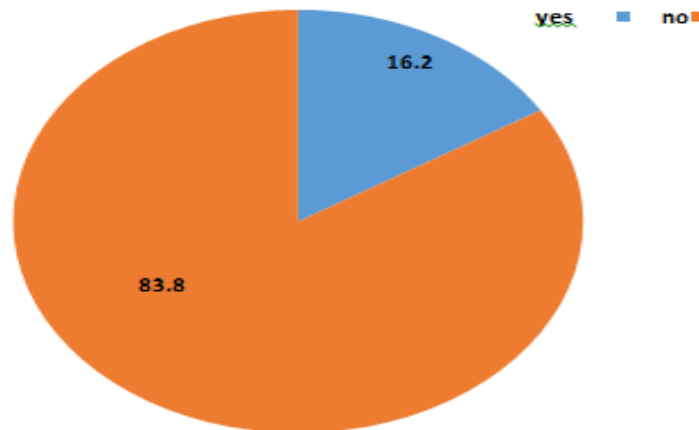


Figure 28: Perinatal mortality

Preterm Birth: Majority of the babies born to the mothers in the study were term accounts for 72.1% (142 babies). 55 babies (27.9%) were born as preterm. (Fig 29)

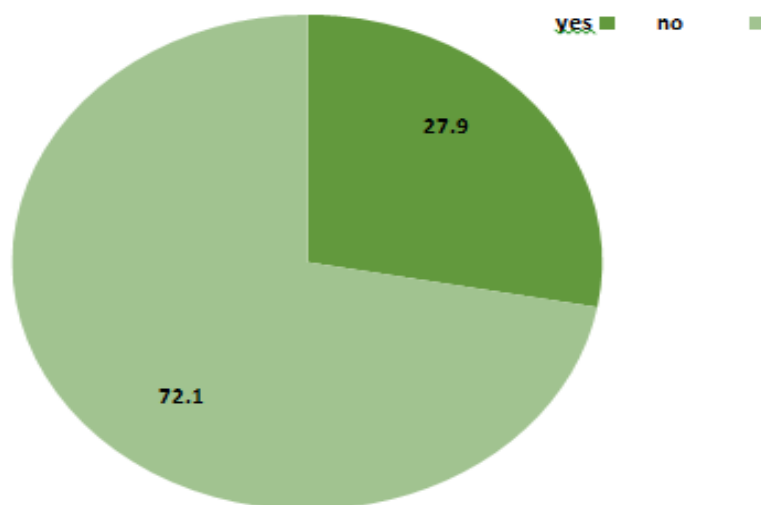


Figure 29: Preterm birth

Discussion

197 pregnant women presented with complaints of decreased perception of fetal movements in third trimester who presented to the labour room, Department of Obstetrics and Gynaecology after applying inclusion and exclusion criteria were followed up to detect the maternal and perinatal outcomes in these women. The majority of our study subjects belong to the age group 21 to 25 years (37.1%) with a mean age of 27.34 ± 5.03 years. In the study conducted by Belay HG, Tamiru AT and Semahagn on 95 cases and 190 controls, the mean age of cases was $29.58 (\pm 6.5)$ years. [9] Majority of our study population were Primigravida (56.3%). In the study of Clarie M McCarthy, S Meaney and K O'Donoghue, 50.2% were primiparous. [10] 69% had term birth and 31% were preterm.

In the study of Belay HG, Tamiru AT and Semahagn, 33.7% had preterm birth. [9] 53.8% of our study subjects were uncomplicated and 46.2% had obstetric co-morbidities among them, 25.4% had Diabetic disorder and 14.2% had Hypertensive disorder. In the study conducted by Poojari VG, Kumar SS and Vasudeva, 47.14% had high risk pregnancy with 9.5% had Diabetic disorders and 11.9% had Preeclampsia. [11] 44.2% of the study subjects had previous uncomplicated pregnancy, 38.3% had past history of abortion of which, 26.7% had one 1st Trimester abortion and 11.6% had two 2nd Trimester abortion and 3.5% had history of intrauterine fetal demise (IUD) in their previous pregnancy.

In the study of Clarie M McCarthy, S Meaney and K O'Donoghue, 28.2% had previous first trimester abortion. 85.8% had one episode of decreased fetal movements while 14.2% of cases had 2 or more episodes of reduced fetal movements. In the study of Scala C, Bhide A, Familiari A, Pagani G, Khalil A and Papageorghiou, 83.4% had a single episode of RFM and 16.6% had ≥ 2 presentations for RFM. [12] However, in the study conducted by Clarie M McCarthy, S Meaney and K O'Donoghue, only 2.59% subjects were presented for second time with decreased fetal movements. [10]

In our study, 35% of the women were obese and the mean BMI was 23.64 Kg/m^2 . 32.5% of our patients had normal BMI and 22.3% women were overweight. In the study of Clarie M McCarthy, S Meaney and K O'Donoghue, 23% of the study subjects with decreased fetal movements had a BMI of more than 30 kg/m^2 . [10] Majority of our study population did not had any abnormalities in fetal growth (69.4%), liquor volume (76.3%), Doppler values (89.6%) and had a normal BPP (97.1%) and APGAR score (81.2%). 18.5% of the subjects had oligohydramnios and 5.2% had polyhydramnios. In the study by Poojari VG, Kumar SS and Vasudeva, 7.14% had

oligohydramnios and 4.2% had oligohydramnios. [11]

However, in the study of Belay HG, Tamiru AT and Semahagn, it was noticed that there was 4.13 times increased odds of reduced fetal movements in women with oligohydramnios as compared with those with normal liquor. [9] We have noticed that 12.2% were diagnosed with intrauterine fetal demise (IUD) on presentation with reduced fetal movements. But in the study of Clarie M McCarthy, S Meaney and K O'Donoghue, 1.5% of the women had IUD on presentation. 10 13.7% of our study subjects had spontaneous onset of labor and the rest were either induced (77.15%) or underwent caesarean section without induction (9.15%).

Among 152 patients who were induced (77.15%), the most common indication was decreased fetal movement itself (37.5%) followed by term induction (11.8%). We observed that, 45.7% of our patients had Normal delivery and 32% underwent caesarean section.

The most common indication being no reassuring fetal heart rate (NRFHR) in 30.2% of the women. In the study of Clarie M McCarthy, S Meaney and K O'Donoghue, 42.8% had spontaneous onset of labour and 32.6% had caesarean section. Among 42.4% of the women who were induced in their study, 36.8% was for decreased fetal movements 10 which is comparable with our study. Caesarean section was done for 29.47% in the study of Belay HG, Tamiru AT and Semahagn. [9] Among the 24 patients (12.2%) with IUD, 37.5% had spontaneous onset of labour and the rest were induced. 20.5% of patients with nonreactive NST and 37.5% with placental abruption had spontaneous onset of labour.

Majority of the study subjects induced were term patients of which 84% had uncomplicated pregnancy. 84.3% with reactive NST and patients with reduced diastolic flow in umbilical artery were also induced. It was noticed that there is no association of maternal age, gestational age, BMI, complications in present or past pregnancies, obstetric score, the frequency of presentation with reduced fetal movements, growth of the baby and liquor volume with caesarean section rate.

We found a significant association between increased caesarean section rate and abnormal Doppler values including REDF and AEDF (p value 0.011) and nonreactive NST (p value < 0.001) and abruption (p value < 0.001). However, in the study done by Aviram, Shmueli, Hirsch, Ashwal, Wiznitzer and Yogev it was observed that decreased fetal movements in singleton pregnancies at term among nulliparous and multiparous women is associated with increased risk of caesarean delivery. [13] The mean birth weight of our new born is 2.5 kg while the mean birth weight of the newborns in the study

of McCarthy, S Meaney and K O'Donoghue was 3.4 kg. In 39.6 % babies in our study, the birth weight ranges from 1-2.49 kg and 36% were in the range of 2.5 to 3kg.

Among 173 live babies in our study, 18.8% had an APGAR score of <7, 23.1% had respiratory distress, 12.1% had perinatal asphyxia requiring resuscitation, 6.4% had meconium aspiration syndrome and 27.7% required admission in NICU. It was also observed that 27.9% of the newborns were preterm and 16.2% had perinatal mortality. Clarie M McCarthy, S Meaney and K O'Donoghue, observed that 18% of the babies in their study had APGAR <7, 28% required NICU admission and still birth rate 14.5 per 100010 while there was 38% still birth in the study of Belay HG, Tamiru AT and Semahagn. [9]

Further, we found a significant association between low APGAR score of <7 with various factors including obstetric score mainly in multipara, present and past pregnancies with obstetric complications, patients who were not counselled regarding DFMC, Doppler abnormalities like REDF in umbilical artery, spontaneous onset of labour, preterm or vacuum delivery. Also, APGAR score has a negative correlation with maternal age and BMI while it has a positive correlation with gestational age and APGAR score.

Low birth weight babies were found in those women with complicated present pregnancies, IUGR, REDF in umbilical artery, and IUD. Low birth weight babies were found to be associated with preterm delivery, low maternal BMI, low BPP score and an APGAR score of <7. There is statistically significant association between respiratory distress and various factors like mean gestational age (preterm), mothers having complications in present and past pregnancies, those presented with decreased fetal movements for more than once, babies with IUGR, oligamnios and REDF in umbilical artery, nonreactive NST, blood stained liquor (abruption) followed by meconium stained amniotic fluid, spontaneous onset of labour, preterm or vacuum delivery, APGAR score <7, and low birth weight < 2.2 kg.

There is statistically significant association between perinatal asphyxia requiring resuscitation with various factors such as preterm deliveries, mothers having complications in present and past pregnancies, those presented with decreased fetal movements for more than once, babies with IUGR, oligamnios and REDF in umbilical artery, nonreactive NST, placental abruption, babies born by caesarean section, APGAR score <7, low birth weight <2 kg. We noticed a statistically significant association between Meconium aspiration syndrome with women presenting 2nd time with decreased fetal movements (p value 0.001), APGAR score less than 7 (p value <0.001),

respiratory distress (p value <0.001) and perinatal asphyxia (p value 0.005). It was observed that there is significant association between the babies requiring NICU admission with multipara, preterm babies (p value <0.001), babies with IUGR (p value <0.001), oligohydramnios (p value <0.001) and Doppler abnormalities like REDF, AEDF and reduced diastolic flow in umbilical artery (p value < 0.001) and nonreactive NST (P value 0.004). There was also significant association of NICU admitted babies with spontaneous onset of labour, caesarean section, abruption and meconium stained liquor, babies with APGAR score of < 7, low birth weight <2 kg, respiratory distress, perinatal asphyxia and meconium aspiration syndrome.

In our study we had 32 perinatal mortality which was significantly associated with multiparous women, complications in present or past history, patients who were not counselled regarding fetal movement counting methods, REDF in umbilical artery, nonreactive NST, spontaneous onset of labour, preterm birth or vacuum delivery, abruption, meconium stained amniotic fluid, low APGAR score (<7), respiratory distress, perinatal asphyxia and meconium aspiration syndrome with perinatal mortality. In the study, statistically significant association was found between preterm birth (p value <0.001) and various factors like nullipara (p value 0.016), patients with complications in present pregnancy (p value 0.02), fetus with IUGR (p value 0.001), oligohydramnios (p value 0.016), REDF in umbilical artery (p value <0.001) and IUD (p value <0.001), nonreactive NST (p value 0.017), spontaneous onset of labour (p value 0.001), APGAR score less than 7 (p value <0.001), low birth weight (p value <0.001), respiratory distress (p value <0.001), perinatal asphyxia (p value <0.001), NICU admission (p value <0.001) and perinatal mortality (p value <0.001). In our study we have observed that patients with obstetric or medical complications in present or past pregnancies, those presented with decreased perception of fetal movements for more than once were significantly associated with poor perinatal outcomes.

Also perinatal mortality was found to be associated with those patients who were not counselled regarding fetal movement counting methods which shows the importance of patient education regarding DFMC (daily fetal movement counting). In the study of Poojari VG, Kumar SS and Vasudeva, it was found out that more than 2 episodes of decreased fetal movement was associated with poor perinatal outcome. [11] Study done by Belay HG, Tamiru AT and Semahagn showed that the women who were perceived reduced fetal movement had more adverse birth outcomes like still birth, preterm birth, low Apgar score and increased rate of cesarean section as compared to the mothers who

doesn't had reduced fetal movement. [9]

Conclusion

Women presented with reduced fetal movement were associated with poor perinatal outcomes like preterm birth, low APGAR score, perinatal asphyxia requiring resuscitation, respiratory distress, meconium aspiration syndrome, NICU admission and perinatal mortality and also had an increased rate of cesarean section. Those patients with obstetric and medical complications in present or past pregnancies and those presenting with decreased perception of fetal movements for more than once were associated with poor perinatal outcome. Even though, majority of the study population were primigravida, multigravida was found to be associated with poor perinatal outcome. It was also noticed that there was an increased rate of induction among the study subjects.

Limitation

Pregnant women with viral infections like Hepatitis A, B, C, HIV, and Covid, those with renal diseases, psychiatric illness, renal diseases APLA, and connective tissue disorders were not come under my study population.

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