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Original Research

The Impact Of The Abruption Severity And The Onset-To-Delivery Time On The Fetomaternal Outcome: A Retrospective Study

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Abstract

Background: Placental abruption is defined as the complete or partial separation of a normally implanted placenta after 28 weeks of pregnancy but before delivery.It is a major obstetric complication associated with an increased risk of fetal and maternal morbidity & mortality globally.

Aim: This study was conducted to examine the impact of the abruption severity and the onset-to-delivery time on the maternal and neonatal outcomes in cases of placental abruption.

Material and methods: All the case sheets of the women who were diagnosed with placental abruption at 28 weeks of gestation and beyond in tertiary care hospital at R.L. Jalappa Hospital, Kolar from January 2018 to December 2022 have been reviewed. The fetomaternal outcome were recorded by the parity, gestational age, Hemoglobin at admission, risk factor of placental abruption, admission to delivery interval, mode of delivery, massive transfusion, Apgar score, ICU&NICU admission. All the data collected were entered into proformas for further statistical analysis.Data was analyzed with Microsoft Excel and Statistical Package for Social Sciences (SPSS) software version 22.0. Data was also represented using appropriate diagrams like bar diagram, pie diagram. Mean and standard deviation of the quantitative variables were measured. P value ≤ 0.05 was taken as significant.

Results: In this study, Total 74 participants were included. Majority 40 (54.05%) of the total subjects were aged between 21 to 30 years. 34 subjects (45.94%) were booked. 44 (59.45%) subjects belonged to multigravida group. Most of the subjects belonged to the gestational age of 36-40 weeks accounting for 36 (48.64%) cases. In our study, 26 (35.13%) had Grade 2 abruption, 22 (29.72%) subjects had Grade 3A abruption. 38 (51.35%) subjects underwent LSCS, 30 (40.54%) had vaginal delivery. 12 subjects were admitted to ICU. 29 (63.05%) neonates were admitted in NICU.

Conclusion: The severity of placental abruption is significantly correlated with poor fetal outcome and there were significant impact of severity of abruption and onset to delivery on maternal outcome.

Keywords: placental abruption, maternal morbidity, pregnancy

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Introduction

Placental abruption is defined as the complete or partial separation of a normally implanted placenta after 28 weeks of pregnancy but before delivery. It is a serious multifactorial obstetric complication, and its etiopathogenetic mechanism is not yet entirely understood.[1]It occurs in about 0.38–1% of singleton births, and in 1–2% of twin pregnancies.[2,3] It is a major obstetric complication associated with an increased risk of fetal and maternal morbidity and mortality globally, especially in developing countries where the incidence varies from 4 to 6%.[4,5]

Placental abruption accounts for 20–25% of antepartum hemorrhage, resulting in increased maternal peripartum risk factors like disseminated intravascular coagulopathy, postpartum hemorrhage, severe maternal shock, emergency hysterectomy, acute renal failure and maternal death.[6-8] Adverse fetal outcomes like intrauterine growth restriction, preterm birth, low birth weight, fetal distress, low Apgar score,

transfer to neonatal intensive care unit, stillbirth, congenital anomalies and perinatal death ranging from 4.4 to 67.3% are also observed in cases of Placental abruption.[9,10]

Classification Based on whether external bleeding is present or not: Revealed, Concealed, Mixed.

Page's classification: Grade 0,1,2,3

Sher's classification: Grade 1, 2,3A, 3B

Burnet lunen classification: Mild, Moderate, Severe

This study was conducted to assess the impact of the abruption severity and the onset-to- delivery time on the fetomaternal outcome.

Materials & Methods

It was aretrospective observational study

Inclusion Criteria: All patients admitted at at R.L Jalappa Hospital and Research Centre, Kolar from January 2018 to December 2022 with placental abruption at 28 weeks of gestation and beyond were be included in the study.

Exclusion Criteria: Women with a gestational age of less than 28 weeks, women diagnosed with antepartum hemorrhage but having causes other than placental abruption (i.e. placenta previa, with pathology in the lower genital tract, with bleeding disorders) were excluded from the study.

All the case sheets of the women who were diagnosed with placental abruption at 28 weeks of gestation and beyond in tertiary care hospital at R.L. Jalappa Hospital, Kolar from January 2018 to December 2022 have been reviewed. The fetomaternal outcome were recorded by the parity, gestational age, Hemoglobin at admission, risk factor of placental abruption, admission to delivery interval, mode of delivery, massive transfusion, Apgar score, ICU&NICU admission.All the data collected were entered into proformas for further statistical analysis.Data wasanalyzed with Microsoft Excel and Statistical Package for Social Sciences (SPSS) software version 22.0. Data was also represented using appropriate diagrams like bar diagram, pie diagram. Mean and standard deviation of the quantitative variables were measured. P value ≤ 0.05 was taken as significant.

Results

Table 1: Age-wise distribution of subjects (N=74)

Age group	Frequency	Percentage
<20 years	12	16.21%
21-30 years	40	54.05%
>30 years	22	29.72%

Most of the subjects belonged to age group of 21-30years accounting for 40 cases.

Figure 1: Bar Diagram of Age-wise distribution of subjects (N=74)

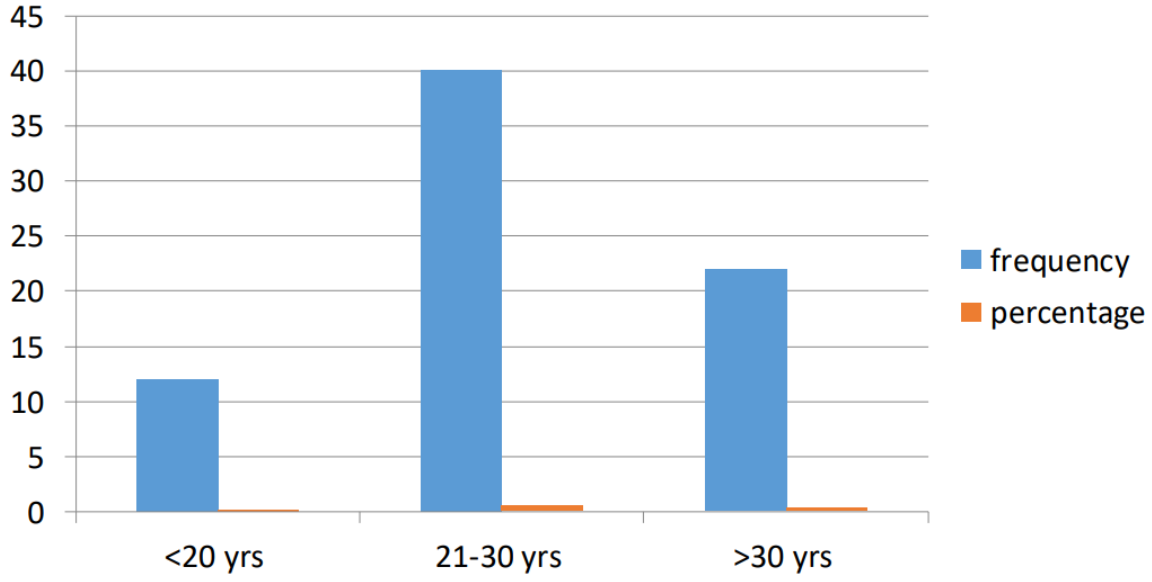


Table 2: Gravida status of study subjects (N=74)

Gravida status	Frequency	Percentage
Primigravida	30	40.54%
Multigravida	44	59.45%

44 subjects belonged to multigravida and 30 from primigravida.

Figure 2: Pie Diagram of Gravida status of study subjects (N=74)

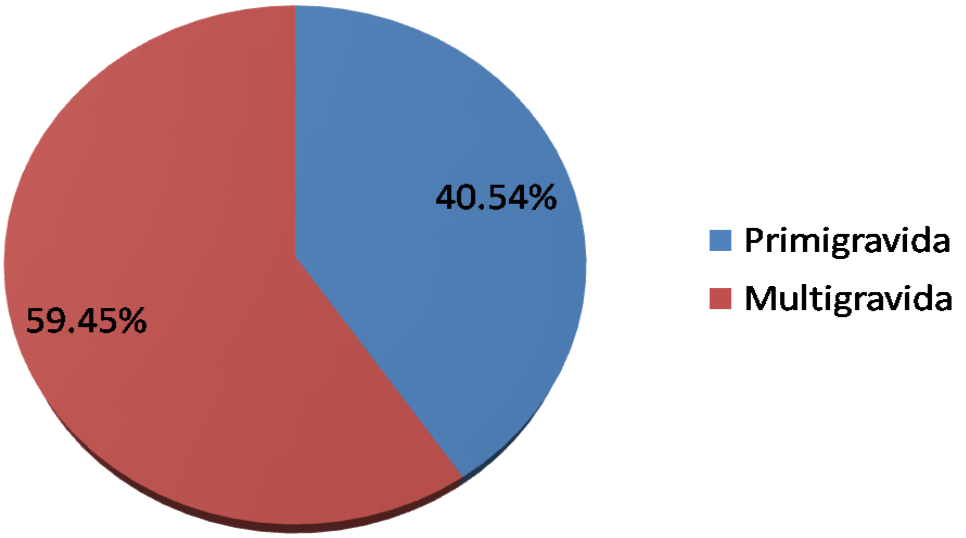


Table 3: Gestational age at admission of study subjects (N=74)

Gestational age	Frequency	Percentage
<36 weeks	28	37.83%
36-40 weeks	36	48.64%
>40 weeks	10	13.51%

Most of the subjects belonged to the gestational age of 36-40 weeks accounting for 36 cases.

Figure 3: Bar Diagram of Gestational age at admission of study subjects (N=74)

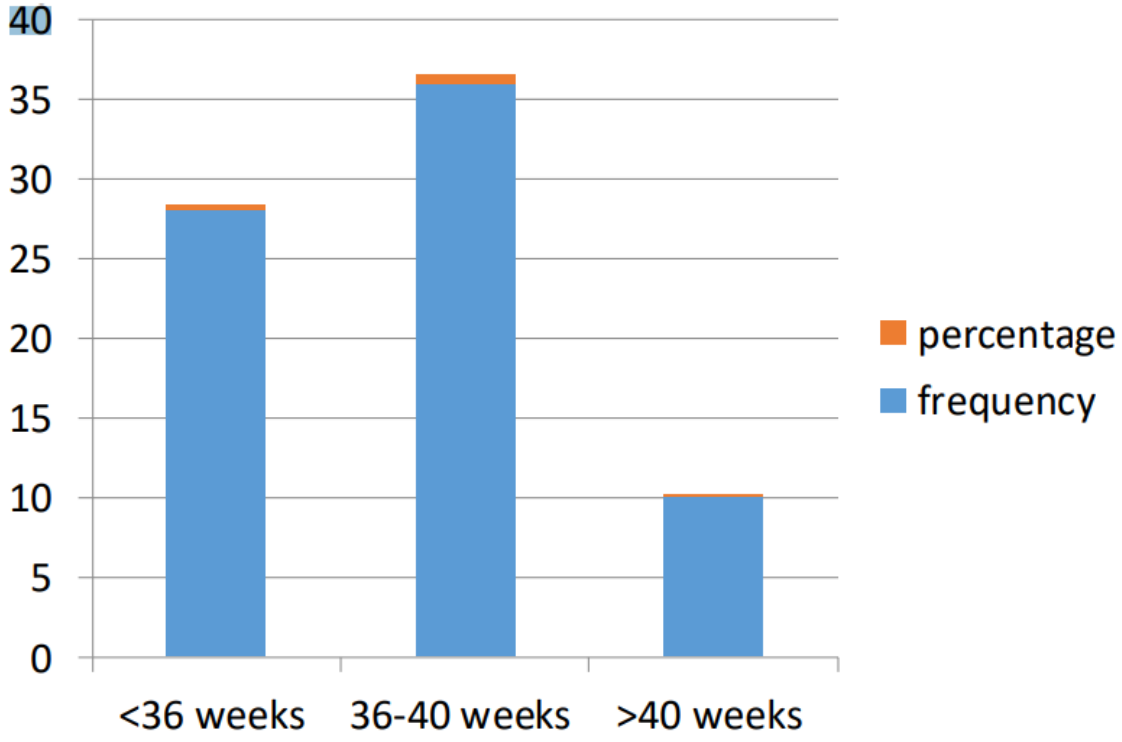


Table 4: Booking status of subjects (N=74)

Booking status	Frequency	Percentage
Booked	34	45.94%
Unbooked	40	54.05%

34 subjects (45.94%) were booked and 40 (54.05%) were unbooked.

Figure 4: Bar Diagram of Booking status of subjects (N=74)

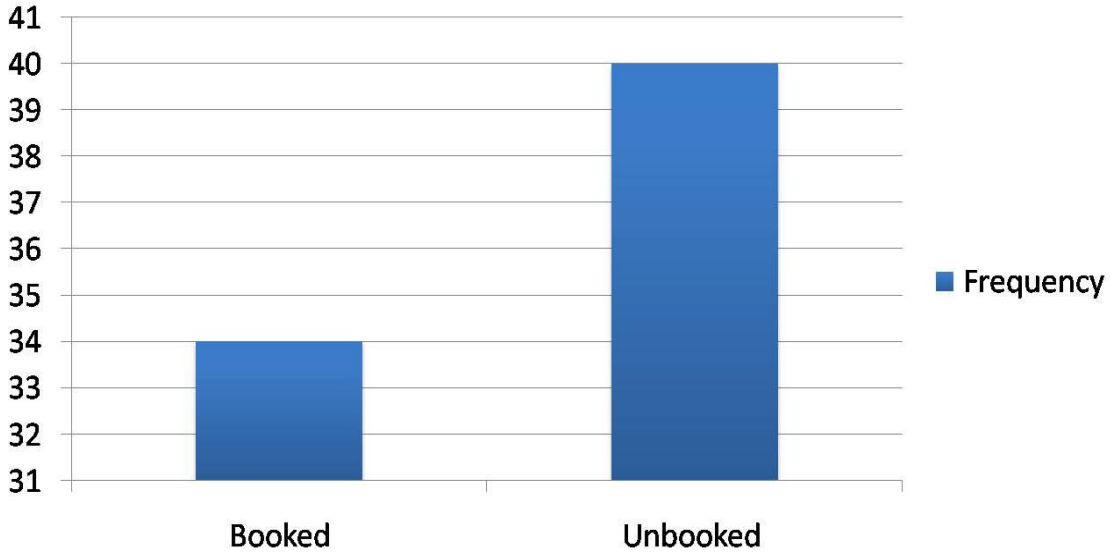


Table 5: Gradesof Placental Abruption in study subjects (N=74)

Grades Of Placental Abruption	Frequency	Percentage
Grade 1	12	16.21%
Grade 2	26	35.13%
Grade 3A	22	29.72%
Grade 3B	14	18.91%

12 (16.21%) subjects had Grade 1 placental abruption, 26 (35.13%) had Grade 2 abruption, 22 (29.72%) subjects had Grade 3A abruption while 14 (18.91%) subjects had Grade 3B placental abruption.

Figure 5: Bar diagram of Grades of Placental Abruption in study subjects (N=74)

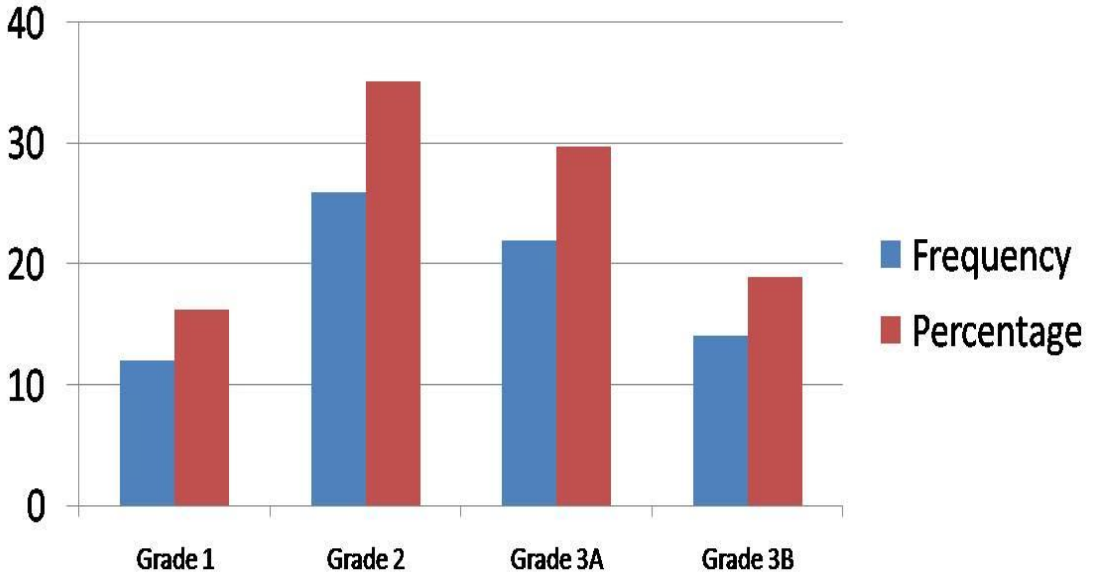


Table 6: Duration of Abruption onset to Delivery Time in subjects (N=74)

Duration	Number of cases	Incidence
<6 hours	40	54.05%
6-8 hours	19	25.67%
>8 hours	15	20.27%

Figure 6: Pie Diagram of Duration of Abruption onset to Delivery Time in subjects (N=74)

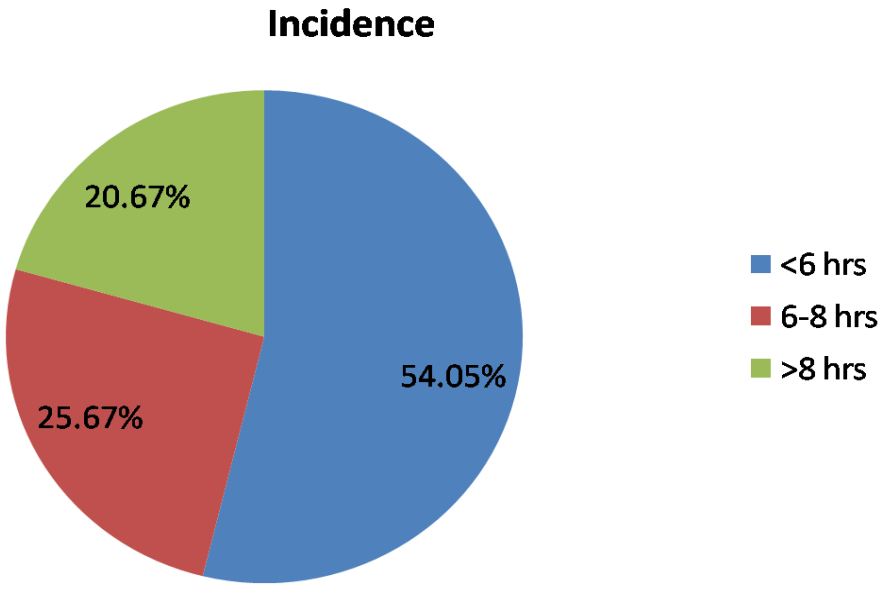


Table 7: Mode of Delivery in study subjects (N=74)

Mode of delivery	Frequency	Percentage
Normal	30	40.54%
LSCS	38	51.35%
Instrumental	06	8.10%

38 (51.35%) subjects underwent LSCS, 30 (40.54%) had vaginal delivery while 6 subjects had instrumental vaginal delivery.

Figure 7: Pie Diagram of Mode of Delivery in study subjects (N=74)

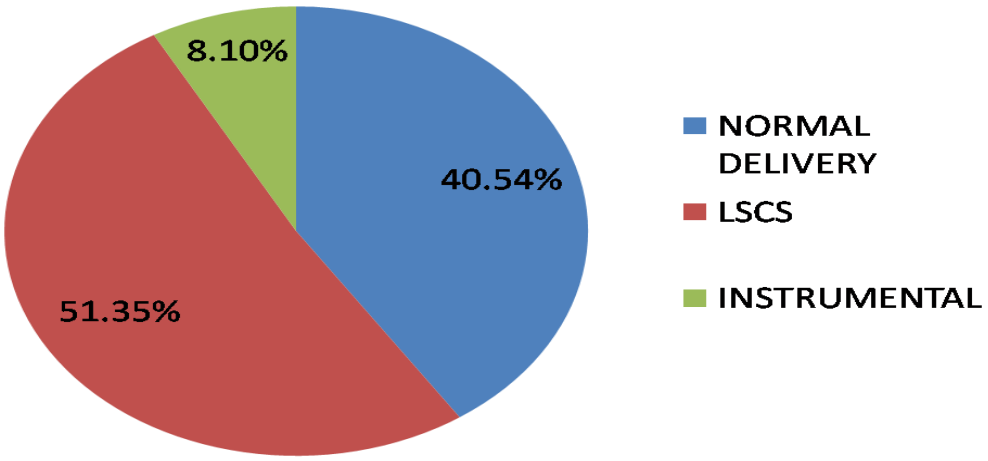


Table 8: Admission to ICU in the study subjects (N=74)

ICU admission	Frequency	Percentage
Yes	12	16.22%
No	62	83.78%

12 (16.21%)out of 74 subjects were admitted to ICU.

Figure 8: Pie Diagram of Admission to ICU in the study subjects (N=74)

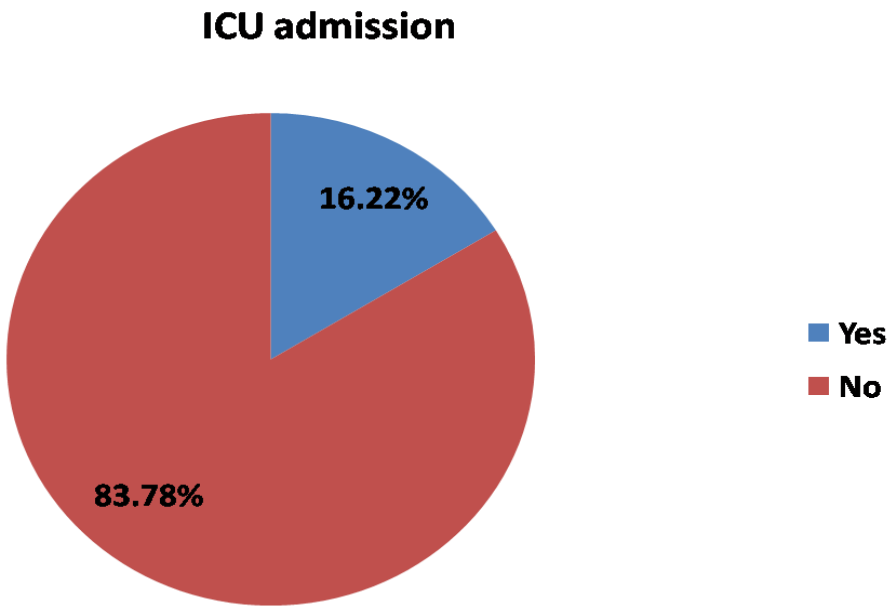


Table 9: Maternal Mortality in study population (N=74)

Maternal Mortality	Frequency	Percentage
Yes	01	1.35%
No	73	98.64%

Maternal mortality of 1.35% was observed.

Fig1ure 9: Pie Diagram of Maternal Mortality in study population (N=74)

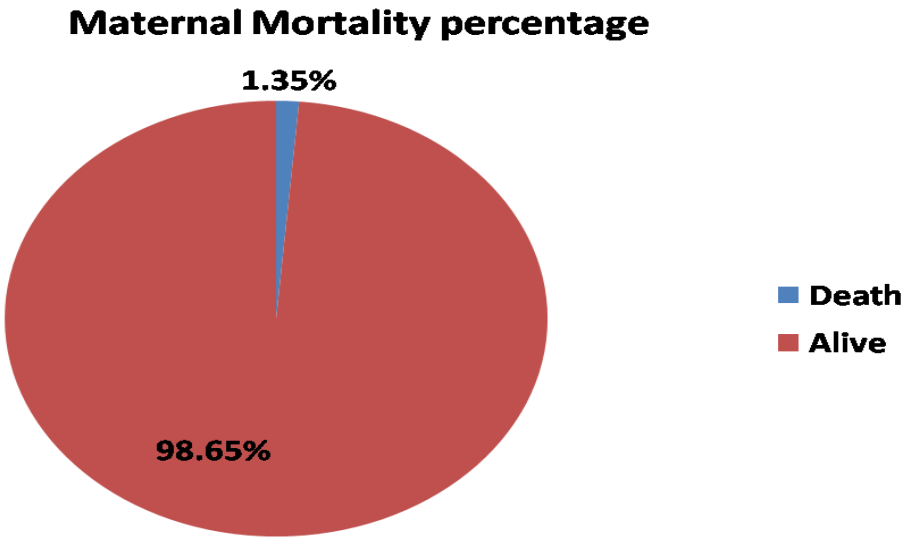


Table 10: Fetal outcome in subjects (N=74)

Fetal outcome	Frequency	Percentage
IUD at admission	28	37.83 %
Alive	46	62.16 %

Intrauterine fetal demise (IUD) at admission was observed in 28 (37.8%) cases while 46(62.16%) were alive.

Figure 10: Bar Diagram of Fetal outcome in subjects (N=74)

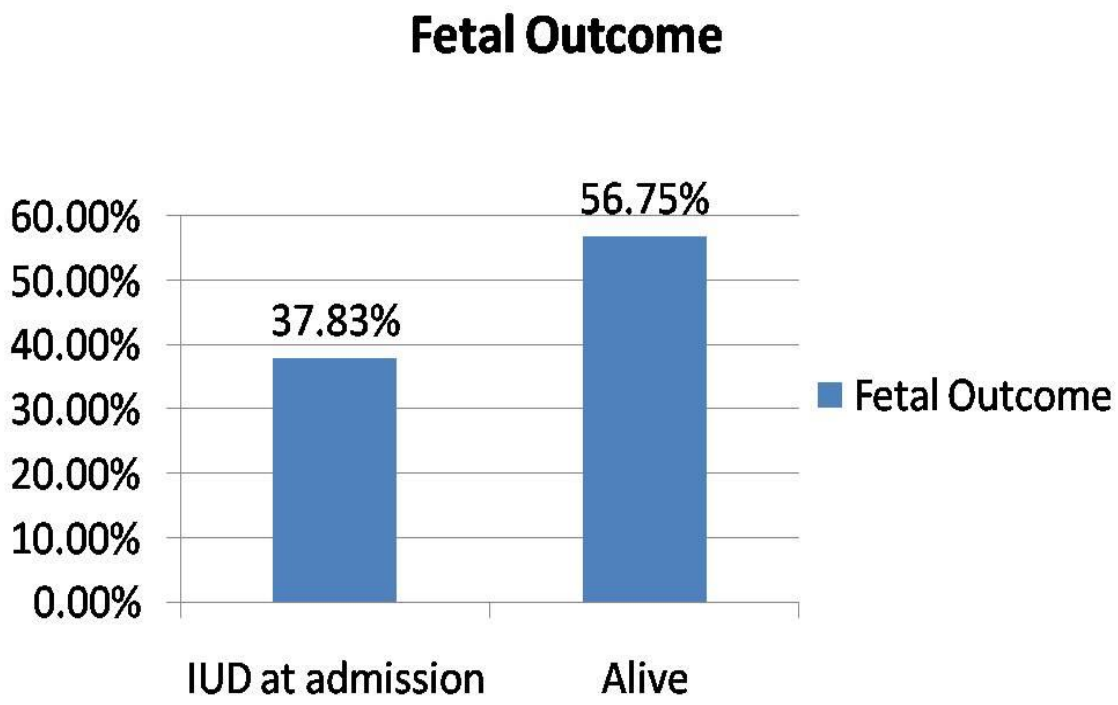
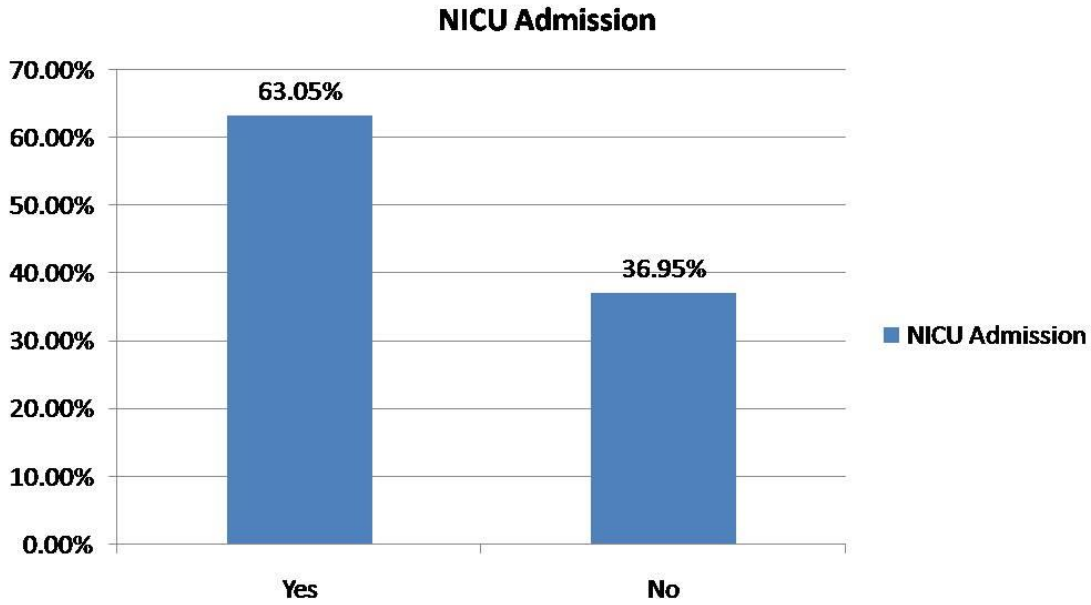


Table 11: NICU admission of study subjects(N=46)

NICU admission	Frequency	Percentage
Yes	29	63.05 %
No	17	36.95 %

29 (63.05%) neonates were admitted in NICU.

Figure 11:Bar Diagram of NICU admission of study subjects (N=46)



Discussion

Abruptio placenta is classically defined as the complete or partial separation of a normally implanted placenta before delivery of the fetus.[11] Placental separation occurs due to rupture of a uterine spiral artery leading to bleeding into decidua basalis expanding as retroplacental hematoma causing compromise of the blood supply to the fetus.[12] Abruption occurs in 0.4-1% of pregnancies. Obstetric haemorrhage accounts for 1/3rd of maternal death.

Perinatal mortality is high with abruption due to its strong association with preterm. Abruptio placenta is abnormal bleeding from small uterine arteries into decidua basalis.[13] The most probable factor causing abruptio placenta is an insufficient trophoblastic invasion.Placental abruption presents with clinical signs of painful vaginal bleeding (concealed or revealed), uterine contractions, and non-reassuring fetal heart rate.[14] Placental abruption is associated with preterm labour, low birth weight, and fetal demise. The perinatal mortality and morbidity of abruptio placenta depend on the gestational week at which abruption developed.[15] In this study, Total 74 participants were included. Majority 40 (54.05%) of the total subjects were aged between 21 to 30 years. 34 subjects (45.94%) were booked. 44 (59.45%) subjects belonged to multigravida group and 30 were Primigravida. Most of the subjects belonged to the gestational age of 36-40 weeks accounting for 36 (48.64%) cases. In our study, 12 (16.21%) subjects had Grade 1 placental abruption, 26 (35.13%) had Grade 2 abruption, 22 (29.72%) subjects had Grade 3A abruption while 14 (18.91%) subjects had Grade 3B placental abruption. 38 (51.35%) subjects underwent LSCS, 30 (40.54%) had vaginal delivery while 6 subjects had instrumental vaginal delivery. 12 subjects were admitted to ICU. Maternal mortality was 1.35% in our study. Intrauterine fetal demise (IUD) at admission was observed in 28 (37.8%) cases while 46(62.16%) were alive. 29 (63.05%) neonates were admitted in NICU. Onishi K et al[16]examined the impact of the abruption severity and the onset-to-delivery time on the maternal and neonatal outcomes of cases of clinically diagnosed placental abruption (PA). They investigated 84 patients who were diagnosed with abruption at their hospital from January 2009 to September 2017. They classified the patients with abruption into three groups based on the extent of the abruption: (1) mild abruption, <20%; (2) moderate abruption, 20-49%; (3) severe abruption, ≥50%, which was defined by the attending obstetricians at the time of delivery. The neonatal outcome was measured by the umbilical artery pH and the maternal outcome was measured by the obstetric disseminated intravascular coagulation score (DIC score). The rate of hypertensive disorders of pregnancy in the moderate abruption group was significantly lower than that in other groups (p = .010). The umbilical artery pH was below 7.00 in 29 cases. There was a significant correlation between the onset-to-delivery time and the umbilical artery pH in the moderate group (R = -0.43). The maternal DIC scores in the three groups did not differ to a statistically significant extent. The severity of placental separation is significantly correlated with poor neonatal outcomes.[16] Khan S et al[17] conducted a study to find out the frequency of abruptio placenta in women with pregnancy-induced hypertension in 2021. Women of gestational age above 20 weeks were included. Patients with blood pressure ≥140/90mmHg were considered as having pregnancy-induced hypertension. Descriptive statistics were calculated. Stratification was done and the post-stratification chi-square test was applied. P-value ≤ 0.05 was taken as significant.A total of 205 patients were included in the study. The mean age was 24.26±2.92 years. The mean gestational age was 30.82±3.22 weeks. The mean parity was 2.59±0.80 children. Mean systolic blood pressure was 148.48±5.99 mmHg and mean diastolic blood pressure was 94.85±3.05 mmHg. Bleeding was reported in 110 (53.7%) cases. Lower abdominal tenderness in 125 (60.5%) cases. Fetal heart rate was normal in 16.6% of the cases. Abruptio placenta was observed in 29 (14.1%) patients.Abruptio placenta is a life-threatening condition that occurs during pregnancy that can result in both maternal and fetal morbidity and mortality. Adequate and urgent intervention can result in a favourable outcome.[17]

Conclusion

The severity of placental abruption is significantly correlated with poor fetal outcome and there were significant impact of severity of abruption and onset to delivery on maternal outcome.

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