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Original Research Article

AN ANALYTIC STUDY OF INCIDENCE, CLINICAL FEATURES, RISK FACTOR, MANAGEMENT AND OUTCOME OF PLACENTAL ABRUPTION IN A TERTIARY CARE CENTRE

CH. Madhuri[1], B. Suryakumari[2], V. Gitasree[3], R. Sujatha[4], Nikhita[5]

[1]Associate Professor, Rangaraya Medical College, Kakinada, Andhra Pradesh, India
[2]Assistant Professor Rangaraya Medical College, Kakinada, Andhra Pradesh, India
[3]Assistant Professor, Rangaraya Medical College, Kakinada, Andhra Pradesh, India
[4]Associate Professor, Rangaraya Medical College, Kakinada, Andhra Pradesh, India
[5]Post graduate, Rangaraya Medical College, Kakinada, Andhra Pradesh, India

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Corresponding Author:
Dr. R. Sujatha,
Email: drsujathareddy@rediffmail.com

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Abstract

Background: Abruptio Placenta is one of the major causes of maternal morbidity and fetal mortality. It is defined as premature separation of a normally situated placenta before delivery. The incidence of abruptio placentae is around 0.6-1% of all births. Aim: To study the incidence and clinical features, risk factors, management and outcome of mother and fetus in patients with Placental abruption. **Materials and Methods:** It is a hospital based prospective observational study of all patients for the period of two years, diagnosed with abruptio placentae admitted in GGH, Kakinada. All antenatal women with abruptio placenta admitted in the Department of Obstetrics and Gynaecology, Government Hospital Kakinada.150 antenatal women with abruptio placenta admitted in Labour ward, were included in the study. Inclusion criteria: All antenatal women diagnosed to have abruption, mainly by clinical signs and symptoms, also radiological diagnosis. Exclusion criteria :Antenatal women who came with history of antepartum haemorrhage but diagnosed as having local cervico vaginal lesions like cervical polyp, cervical carcinoma, varicose vein, local trauma patients diagnosed to have placenta previa and vasaprevia and unexplained bleeding from genital tract. All the patients with detailed history, clinical examination, appropriate laboratory investigations, management and feto maternal outcome were analysed. **Result:** The mean age was 26.55±4.26 years. One third of the patients belong to lower class.46.7% were primi gravida. 64.7% of cases in the study presented with abruption at 33-36 weeks of gestation.1.3% had HTN, 3.3% had DM, 1.3% had convulsions, 4.7% had bronchial asthma, 17.3% had thrombophilia, 12.7% had blood transfusion, 1.3% had drug allergy, 7.3% had thyroid disorders. Multiparity in 53.3%, 14.7% had advancing age>30 years, 31.3% with poor socio economic status, 30.7% with nutritional anaemia, 60% had hypertensive disorders, 6.7% had gestational HTN, 51.3% had preeclampsia, 2% had chronic HTN, 2% had multiple pregnancy, 4% had polyhydramnios, 3.3% had prior abruption, 2% had uterine malformation, 17.3% had premature rupture of membranes, 8% had trauma, 12% had fibroids, 17.3% had h/o thrombophilia, 2% were smokers. Most of the cases presented with vaginal bleeding with grade 2. 75%of the women delivered by caesarean section. 60% of the study population had PPH and blood transfusions were given to more than 70% of study population, and maternal mortality in 2.6%. perinatal outcome includes 86% had live births and 14% with IUD and stillbirth. Neonatal death occurred in 1.5%. **Conclusion:** With assessment of risk factors at the earliest, timely diagnosis and early intervention can help to improve the maternal and fetal outcome further.

INTRODUCTION

Abruptio Placenta is one of the major causes of maternal morbidity and fetal mortality. It is defined as premature separation of a normally situated placenta before delivery. The incidence of abruptio placentae is around 0.6-1% of all births. Abruption can occur at any time after 20 weeks, but it is most common in the third trimester. The bleeding may

occur as concealed intrauterine hemorrhage, in which no blood appears at the vulva, or revealed external hemorrhage. The incidence of revealed and concealed hemorrhage is 80% and 20%, respectively. In abruptio, apart from external bleeding, the prognosis also depends on the severity of associated pre-eclampsia, degree of shock, the amount of blood retained in utero and the area of abrupted placenta. It manifests with adverse maternal outcome like severe anaemia, PPH, shock, DIC and unfavorable fetal outcomes like, sudden IUD, still birth, increased NICU admissions due to preterm, low birth rate, birth asphyxia.

Abruptio placentae is the premature separation of a normally sited placenta before birth, after 20 weeks gestation. About 1% of all pregnancies are complicated by clinically recognized abruption.[1–5] The degree of abruption ranges across a broad clinical spectrum, from minor degrees of placental separation, with little effect on maternal or fetal outcome, to major abruption associated with fetal death and maternal morbidity. Abruption sufficient to cause fetal death occurs in about 1 of every 420 deliveries.[5]

If placentas are routinely examined after delivery, evidence of abruption may be found in almost 4% of cases, most of which were unrecognized and of no apparent clinical consequence. There has been an increase of almost 25% in the rate of clinically detected abruption in the United States in recent decades, with a disproportionate increase seen among African-American women.[6]

The incidence of abruption peaks between 24 and 26 weeks' gestation.[7] Approximately 10% of all preterm births occur because of abruption, and the infant outcomes are associated with increased rates of perinatal asphyxia, intraventricular hemorrhage, periventricular leukomalacia, and cerebral palsy when compared with gestational age–matched controls.[8] Perinatal mortality in pregnancies complicated by abruption may be declining overall, but the rate continues to be higher than in gestational age–matched controls without abruption.[9]

Placental separation is strongly associated with preterm premature rupture of the membranes (PPROM), in both a causal and a consequential manner. Most pregnancies complicated by abruption result in the delivery of an infant weighing less than the 10th percentile for gestational age,[10,11] suggesting a common pathway linking abruption to placental dysfunction and intrauterine growth retardation (IUGR). Abruption results from bleeding between the decidua and placenta. The hemorrhage dissects the decidua apart, with loss of the corresponding placental area for gaseous exchange and provision of fetal nutrition.

Dissection can lead to external bleeding if it reaches the placental edge and tracks down between the fetal membranes; circumferential dissection leading to near-total separation of the placenta can occur, particularly with concealed abruption. The underlying event in many cases of abruption is thought to be vasospasm of abnormal maternal arterioles. Some cases may result from venous hemorrhage into areas of the decidua that have become necrotic secondary to thrombosis.

Long-standing predisposition to abruption may be inferred from the finding that women destined to suffer abruption have low levels of pregnancy-associated plasma protein A (PAPP-A).[12] Evidence of pre-existing placental pathology in women with abruption includes poor trophoblastic invasion, inadequate remodelling of the uterine circulation as reflected by abnormal uterine artery Doppler flow, and the well-established associations among preeclampsia, IUGR, and abruption—all of these may be regarded as primary placental disorders.[13,14]

Abruption may also occur secondary to acute shearing forces affecting the placenta- decidua interface, such as those that occur with trauma—particularly rapid deceleration injuries (motor vehicle accidents) and the sudden decompression of an over distended uterus that occurs with membrane rupture in polyhydramnios or delivery of a multiple gestation.

Aetiology

Abruption occurs from rupture of maternal decidual artery or vein at decidual-placental interface, around placental margin, or behind membranes.[15-17] Mechanical disruption may cause acute abruption Sudden decompression of uterus in cases of rupture of membranes in patient with polyhydramnios or after delivery of first of multiple foetuses15Shearing forces for acute abruption due to trauma.[15] Inciting event may be unknown.[15,16]

Pathogenesis

Rupture of maternal artery or vein with bleeding into decidual-placental interface leads to premature separation of a normally implanted placenta15–17 Process may be acute (such as trauma or shearing) or chronic (with process starting as early as first trimester) Rupture of maternal vasculature results in hematoma formation behind placenta with no vaginal bleeding (concealed abruption) or bleeding between membrane and decidua causing vaginal bleeding (revealed abruption). Likely mechanisms involved in abruption include,[16,17] defective trophoblast invasion of uterine arteries Impaired placentation leads Placental insufficiency there by Intrauterine hypoxia so that Uteroplacental under perfusion and vasospasm of small vessels. Immunologic rejection has been hypothesized,[17] Cell-mediated immunity is suppressed and humoral immune response upregulated in normal pregnancy but not in pregnancy complicated by placental abruption. Excessive activation of maternal immune system may lead to rejection of fetus. Excessive activation of maternal immune system may also indicate previous exposure to specific antigens.

Clinical presentation: it varies widely, ranging from a small amount of vaginal bleeding to massive hemorrhage, disseminated intravascular coagulopathy, and intrauterine fetal demise 16 Patient may be asymptomatic.[15–17] Most common

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presentation is vaginal bleeding in second or third trimester (usually dark blood), abdominal pain or back pain, with or without contractions.[15–18]

Vaginal bleeding: Characteristic symptom but may be absent. Occur in 70%-80%. Varies from clinically insignificant to massive hemorrhage correlates poorly with degree of abruption . 2.Abdominal pain may present as uterine irritability, intermittent contractions, typically characterized as high frequency but low amplitude (>5 per 10 minutes - "sawtooth" pattern) with an elevated baseline tone. Persistent dull lower abdominal or back pain Severe abruption may present with painful, distended, and hard uterus, making it difficult to palpate fetal parts. Pain may be accompanied by nausea, vomiting, and reduced or absent fetal movements. Blood-stained amniotic fluid may be present in cases of membrane rupture.[17,18]

Diagnosis: Placental abruption is a clinical diagnosis, which varies with severity of abruption, and there are no sensitive or reliable diagnostic tests available.[16,18,19] Placental abruption should be suspected in pregnant patients with 15–19 Vaginal bleeding, Abdominal pain, Back pain, History of trauma (with or without symptoms)and Unexplained preterm labor Diagnosis may be confirmed with visual inspection of placenta after delivery.[16,17] If recent abruption, look for dark blood clot associated with depression in placenta (delle) If older abruption, look for fibrin deposits at site of abruption and If total abruption, placenta may appear normal Blood tests : Baseline blood tests may include.[15,18,19] Complete blood count at time of diagnosis, repeat as clinically indicated Haemoglobin, Platelet count, Coagulation tests.

Clinical Shock: Low haematocrit, thrombocytopenia, type and cross match at time of diagnosis, Electrolytes, Blood gas and acid-base status (for evaluation of shock) Perform serial complete blood count and maternal coagulation studies at regular intervals in women with severe placental abruption until patient is clinically stable.[15]

Kleihauer-Betke test: In Rh-D-negative women with abruption and antepartum hemorrhage, perform Kleihauer- Betke test to quantify hemorrhage and determine dose of anti-D immunoglobulin required.[18,19] Not sensitive for diagnosis of placental abruption (RCOG Grade C) 19Measure of foetal-maternal hemorrhage by comparing number of cells with fetal haemoglobin to number without in maternal blood sample . Blood smear exposed to acid and then stained for haemoglobin. Fetal haemoglobin more acid tolerant than maternal haemoglobin so fetal cells will stain but maternal cells appear as "ghosts" Cannot be used in patients who have had intrauterine transfusion. Consider screening for thrombophilias in women with unknown cause of abruption.[20]

Imaging Studies: Ultrasound is recommended before a digital exam in women with vaginal bleeding and unknown placental location to rule out placenta previa. While ultrasound can help diagnose some cases of placental abruption, more than 50% of cases may be missed. Diagnostic criteria for placental abruption on ultrasound include intra-amniotic hematoma, subchorionic hematoma, marginal hematoma, increased heterogeneous placental thickness, pre-placental collection under chorionic plate, and retroplacental collection.

Fetal Monitoring: Continuous electronic fetal monitoring should be used if there is active bleeding during labour. The interpretation of fetal heart rate tracing follows the ACOG 3-tiered system with Category I, II, and III tracings indicating different levels of fetal well-being. Toco graphic monitoring may show high frequency, low amplitude uterine contractions in severe abruption. Fetal growth may be monitored with serial ultrasounds if the pregnancy is <34 weeks gestation and there is a stable maternal-fetal pair.

Delivery: The route and timing of delivery are determined by the clinical scenario. Immediate delivery is indicated for moderate-to-severe placental abruption with a live, viable fetus. Vaginal delivery may be attempted if fetal heart tracing is normal, the uterus relaxes between contractions, and trial of labor and delivery can be achieved without maternal or fetal morbidity or death. Most women will require a caesarean section if abruption is progressive, unless labor is advanced. For mild (self-limited) placental abruption or when the diagnosis is uncertain, different management options are considered based on gestational age and maternal and fetal status.

Complications and Prognosis: Maternal complications may include disseminated intravascular coagulation (DIC), renal failure, antepartum hemorrhage requiring transfusion, hypovolemic shock, and Couvelaire uterus (bleeding into myometrium toward serosa). Fetal complications may include fetal distress, periventricular leukomalacia, intraventricular hemorrhage, and preterm delivery (spontaneous or iatrogenic).

Aim:

To study the incidence and clinical features, risk factor, management and outcome of mother and fetus in patients with Placental abruption.

MATERIALS AND METHODS

It is a hospital based prospective observational study of all patients diagnosed with abruptio placentae admitted in GGH, Kakinada. Study design: prospective observational study.

Study population: All antenatal women with abruptio placenta admitted in the Department of Obstetrics and Gynaecology, Government Hospital Kakinada.

Sample size: 150 antenatal women with abruptio placenta admitted in Labour ward.

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Inclusion Criteria

All antenatal women diagnosed to have abruption, mainly by clinical signs and symptoms, also radiological diagnosis.

Exclusion Criteria

Antenatal women who came with history of antepartum hemorrhage but diagnosed as having local causes - cervico vaginal lesions like cervical polyp, cervical carcinoma, varicose vein, local trauma patients diagnosed to have placenta previa and vasaprevia and unexplained bleeding from genital tract. Study period is 2 years, i.e., from April 2021 to March 2023.

A detailed history with clinical examination and appropriate laboratory investigations and management.

RESULTS

The mean age was 26.55±4.26 years. 9.3% belong to 18-21 years, 76% belong to 22-30 years, 14.7% belong to >30 years. [Table 1]

Table 1: Age distribution

Age (Years)	Frequency
18-21	14 (9.3%)
22-30	114 (76.0%)
>30	22 (14.7%)
Total	150 (100.0%)
Mean age	26.55±4.26

In relation to the economic status 31.3% belong to lower class, 24% belong to upper lower class, 27.3% belong to lower middle class, 17.3% belong to upper middle class. 46.7% were primi, 34% were G2, 11.3% were G3, 6.7% were G4, 1.3% were G5. 12.7% belong to 28-32 weeks of gestation, 64.7% belong to 33-36 weeks of gestation, 22.7% belong to >37 weeks of gestation at time of diagnosis.

Table 2: Distribution based on Parity

Parity	Frequency(%)
Primi	70 (46.7%)
Gravida 2	51(34.0%)
Gravida 3	17(11.3%)
Gravida 4	10(6.7%)
Gravida 5	2(1.3%)
Total	150(100%)

Table 3: Distribution based on Gestational age at time of diagnosis

GA(In wks)	Frequency
28-32	19(12.7%)
33-36	97 (64.7%)
>=37	34 (22.7%)
Total	150(100.0%)

95.4% pregnancies with abruption were booked, 4.6% were un booked.

1.3% had HTN, 3.3% had DM, 1.3% had Convulsions, 4.7% had Bronchial asthma, 17.3% have Thrombophilia 12.7% had Blood transfusion, 1.3% had Drug allergy, 7.3% had Thyroid disorders.

Table 4: past history

Past history	Frequency
HTN	2 (1.3%)
DM	5 (3.3%)
Convulsions	2 (1.3%)
Bronchial asthma	7 (4.7%0
Thrombophilia	26 (17.3%)
Blood transfusion	19 (12.7%)
Drug allergy	2 (1.3%)
Heart disease	0 (0%)
Thyroid disorders	11(7.3%)

The incidence of risk factors in the present study are Multiparity in 53.3%, 14.7% had advancing age>30 years, 31.3% with Poor Socio economic status, 30.7% with nutritional anemia, 60% ahd HTN disorders, 6.7% had Gestational HTN, 51.3% had PE, 2% had Chronic HTN, 2% had Multiple pregnancy, 4% had polyhydramnios, 3.3% had prior abruption, 2% had Uterine malformation, 17.3% had Premature rupture of membranes, 8% had Trauma, 12% had Fibroids, 17.3% had H/O thrombophilia, 2% were smokers.

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Table 5: Risk factors

Risk factors	Frequency
Multiparity	80 (53.3%)
Advancing age (>30 years)	22 (14.7%)
Poor SES	47(31.3%)
Nutritional Anaemia	46(30.7%)
HTN disorders	90(60.0%)
Gestational HTN	10(6.7%)
PE	77(51.3%)
Chronic HTN	3(2%)
Multiple pregnancy	3(2%)
Polyhydromnios	6(4.0%
Prior Abruption	5(3.3%)
Uterine Malformations	3(2%)
PROM	26(17.3%)
Trauma	12(8%)
Fibroids	18(12.0%)
H/O Thrombophilia	26(17.3%)
Smoking	3(2%)

58.7%of patients with abruption had pain abdomen, 80.7% had Vaginal bleeding, 21.3% had Headache, 5.3% had blurring of vision, 16% had Vomiting, 36% had epigastric pain, 49.3% had perceiving foetal movements, 8% had Trauma, 108h ad shock, 2% had Convulsions.

Table 6: Distribution based on clinical presentation at the time of Admission

Clinical symptoms	Frequency
Pain abdomen	88 (58.7%)
Vaginal bleeding	121 (80.7%)
Headache	32 (21.3%)
Blurring of vision	8 (5.3%)
Vomiting	24 (16.0%)
Epigastric pain	54 (36.0%)
Perceiving FM	74 (49.3%)
Trauma	12 (8.0%)
Shock	15 (10.0%)
Convulsions	3 (2%)

In patients with abruption 3.3% had history of abruptio placenta in previous pregnancy. 3.3% had Grade 0 abruption, 33.3% had Grade 1 abruption, 34% had Grade 2 Abruption, 26% had Grade 3 abruption, 3.3% had Grade 3 couvelaire uterus.

Table 7: Distribution based on Grade of Placental abruption

Grade of abruption	Frequency
Grade 0	5 (3.33%)
Grade 1	50(33.33%)
Grade 2	51(34.0%)
Grade 3	39 (26.0%)
Grade 3,couvelaire	5 (3.3%)
Total	150 (100%)

Table 8: Distribution based on mode of delivery

Mode of delivery	Frequency
Vaginal	36 (24%)
LSCS	112 (74.7%)
Instrumental (Outlet Forceps/ventouse)	2 (1.3%)
Total	150 (100%)

24%of the patients with abruption had vaginal delivery, 74.7% had LSCS, 1.3% had instrumental delivery.
The 60% of patients with abruption complicated by PPH, 59.3% by Anaemia, 2.7% by DIC, 2.7% by ARF, 5.3% by shock, 7.3% had puerperal sepsis, 3.3% had Intrapartum/Postpartum eclampsia, 0.6% had Emergency Hysterectomy, 72.7% had blood transfusion, 67.3% had Prolonged hospitalisations and maternal death in 2.6%

Table 9: Maternal outcome

Maternal outcome	Frequency
PPH	90 (60%)
Anaemia	89 (59.3%)
DIC	4 (2.7%)
ARF	4 (2.7%)

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Shock	8 (5.3%)
Puerperal sepsis	11 (7.3%)
Intrapartum/Postpartum eclampsia	5 (3.3%)
Emergency Hysterectomy	1 (0.66%)
Blood transfusions	109 (72.7%)
Prolonged hospitalisations	101 (67.3%)
Maternal death	4(2.7%)

Perinatal outcome: 36% of foetuses delivered with APGAR score <7, 86% were alive, 13.3% were IUD, 0.6% were still birth, 70% were NICU admissions, 70.7% were low birth weight, 30.7% were Preterm, 10.7% had birth asphyxia, 1.3% were neonatal death

Birth weight: 8.7% had birth weight <1.5kg, 30.7% had birth weight 1.5kg-2kg, 31.3% had birth weight of 2-2.5lg, 19.3% had birth weight of 2.51-3kg, 8.7% had Birth weight of 3-3.5kg, 1.3% had birth weight of >3.5kg.

Coming to perinatal mortality, 86% were live at birth and 14% died.

Table 10: Perinatal outcome

Perinatal outcome	Frequency
APGAR <7	54 (36.0%)
Alive	129(86%)
IUD	20 (13.3%)
Still Birth	1 (0.66%)
NICU Admission	105 (70%)
Low birth weight	106 (70.7%)
Preterm	46 (30.7%)
Birth asphyxia	16 (10.7%)
Neonatal death	2 (1.3%)

DISCUSSION

In 2017, Subha et al reported that Incidence of Abruptio placenta is 0.5%. In 2020, Gandotra et al in their study reported that Incidence of Abruptio placenta in the study was 2.33. In 2021 Wahane et al in their study reported that incidence of abruptio placentae was 1.05%

It is most common in the women of age group 26-30yrs. 67% of cases were associated with severe pre-eclampsia. Live births were 69.8% while stillbirths were 30.2%. PPH occurred in 19.6% of cases. DIC accounts for 16.7% of the complication.[21]

In 2019, Tambawaala et al conducted a study on perinatal outcomes in abruptio placenta. Study reported that High incidence of perinatal mortality in abruptio placentae is because of increased number of still births. In our studies, the perinatal mortality is 6.6% as compared to all other studies. This decline in perinatal mortality is due to improved obstetric care and excellent NICU facilities which are required for a majority of the cases.[22]

In 2020, Krupa patel et al conducted a similar study to study possible etiological factors of abruptio placentae, analyse maternal outcome, perinatal outcome in the form of maternal morbidity and mortality and discuss possible preventive measures and future management. Study reported that incidence of abruptio placentae is higher in 25-30 year that were 42.5% and more in 2nd gravida patient. PIH was accounting for 50%, most of the patients (95%) were anaemic at admission and majority of them required blood transfusion. one maternal mortality (2.5%) occurred, perinatal mortality was 75%.[23]

. It was most common in the women of age group 20-25yrs. 45.9% of cases were associated hypertensive disorders in pregnancy. Live births were 68.9% while stillbirths were 31.1%. PPH occurred in 20.2% of cases. DIC accounts for 15% of the maternal complications. Birth asphyxia, hyperbilirubinemia and neonatal sepsis were commonest complications in the study.

Hypertensive disorders of pregnancy was a risk factor in 65% of cases followed by premature rupture of membranes (6.4%), H/O prior abruption (2.8%), Polyhydraminos (5%). In 20% of cases vaginal delivery occurred and in 80% caesarean section needed. Severe Anaemia was the commonest complication of abruption placentae followed by postpartum haemorrhage (30%), DIC (15%), AKI (12%). Obstetric hysterectomy was performed in 4% of cases. ICU monitoring required in 3% of cases. 1 maternal mortality occurred and perinatal mortality rate was 68.5%, it can be due to late presentation of the patient to the hospital, during which time it progress to an advanced stage.[24]

In 2022, Jayashree et al in their study a total of 16,082 deliveries occurred during study period, and 140 of them had abruptio placentae with prevalence of 8.7 in 1,000 deliveries. Most of the women belonged to 20–35 years of age (91.4%) and 76 (54.3%) were between 28 and 34 weeks of gestation. One-hundred and thirty-seven (97.9%) had singleton pregnancy and 77 (80%) were multigravida. Seventy-nine (54.5%) had preeclampsia. Postpartum hemorrhage was most frequently observed in maternal complication (30%). Other complications were disseminated intravascular coagulation (5%), intensive care unit (ICU) admission of mother (1.5%), and acute renal failure (9.3%). Interval between diagnosis to delivery and mode of delivery and parity index were analysed as predictors for maternal and perinatal course, but they were not

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significant statistically. Significance was found for multipara and ICU admission of mother (p = 0.023).[25]

In 2022, Shital et al reported that Maximum number of cases of Abruptio Placenta were in the age group of 25 to 30 years with low socioeconomic status, gravida 2-3, unbooked and gestational age more than 37 weeks. 50.53 % cases were having hypertensive disorders, 47.97 % cases had Grade 2 abruptio placenta, 79.3 % patients were delivered vaginally, 53.13% patients had postpartum hemorrhage (PPH). 67.81% patients had postpartum anemia and 63.49% required blood transfusion. Maternal mortality on our study population was 6.69%. 31.1 % neonates required NICU admission. Perinatal deaths in cases of abruptio placenta was 29.8 %.[26]

In 2022, Srividya et al reported that Abruptio placenta accounted for 0.89%, placentae previa 0.35% and unclassified 0.08%. Among APH, abruptio placenta had highest incidence 0.89%. Most of them presented with revealed type of abruption 88%, concealed type being the least (2%) in this study.[27]

CONCLUSION

Abruptio Placenta is a true obstetric emergency which risks lives of both mother and fetus. Its outcome is further affected by prematurity in the fetus, and severe anemia leading to further complications in the mother. Although the risks cannot be eliminated but can definitely be reduced. Avoiding tobacco, smoking, staying away from physical activities which could cause physical trauma, regular antenatal check-ups for early detection of risk factors like hypertension and early intervention. Abruptio Placenta calls for collaboration of obstetrician with radiologists, anesthesiologists, neonatalogists. Thus, with assessment of risk factors at the earliest, timely diagnosis and early intervention can help turn this obstetric emergency to the end result of a healthy mother and a healthy baby i.e., a favourable outcome is possible.

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