

## A STUDY ON PREVALENCE AND COMPLICATIONS OF ABRUPTION IN HYPERTENSIVE DISORDERS OF PREGNANCY IN RELATION TO MATERNAL AND FETAL OUTCOME IN A TERTIARY CARE MATERNITY HOSPITAL

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### ABSTRACT

**Objectives:** The objective of the study was to study the prevalence and complications of abruption in hypertensive disorders of pregnancy in relation to maternal and fetal outcome in a tertiary care maternity center.

**Methods:** It is hospital based prospective observational study done at Government Maternity hospital for period of 2 years. Three hundred and forty antenatal women with hypertensive disorders of pregnancy with gestational age >28 weeks of age more than 20 years, patients are diagnosed mainly on clinical signs and symptoms/ultrasound are included in the study.

**Results:** The prevalence of abruption (36.1%) was seen in 123 among 340 cases of hypertensives. The highest incidence was found among the maternal age of 26 and 30 years (45%). Maximum incidence of abruption was found among those who were between gestational age of 34 and 36 weeks accounted for 50%, hence good fetal outcome in terms of fetal birth weight >1500 g. Among cases of abruption, majority of them were severe pre-eclampsia (48.8%), followed by non-severe pre-eclampsia (28.4%), eclampsia (11.3%), G. hypertension (HTN) (8%), and chronic HTN (3.25%). As most of cases of abruption were Grade 1 abruption, accounting for 53.7%, resulting in good maternal and fetal outcome in terms of reduced mortality due to early diagnosis and initiation of treatment. Maternal complications like anemia were seen in 70%, and PPH in 43.3% of cases, are the most common complications encountered. Shock was noted in 24.4%, of cases, and blood transfusions were required in 78.8% of cases. Eighty-six cases (70%) underwent cesarean section, which reduced the maternal and fetal morbidity and mortality. Fetal outcome in terms of birth weight was in the range of 2000–2500 g in 39% of cases, many babies required NICU admissions 72 out of 123, followed by jaundice 93 out of 123, followed by sepsis. Perinatal mortality was 7.7% due to the IUD, 21 seen due to abruption, and 5 due to non-abruption cases.

**Conclusion:** Uncorrected anemia in pregnancy is accompanying cofactor in abruption, leading to an increased need for blood transfusion, morbidity, and mortality of mother. Hence, the need for correction of anemia by diet, iron, and folic acid supplementation, availability of injectable iron at the rural level improves the outcome.

**Keywords:** Antepartum hemorrhage, Low birth weight, Placental abruption, Anemia.

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### INTRODUCTION

Antepartum hemorrhage (APH) is one of the most challenging obstetric complications encountered in practice. Even though hospitalization for delivery and the availability of blood and blood products have dramatically improved obstetric care, death from hemorrhage still remains a leading cause of maternal mortality. Antepartum hemorrhage is an obstetric emergency contributing to significant amount of maternal morbidity and mortality. APH complicates 2–5% of all pregnancies and is one of the major causes of maternal deaths. Any bleeding from genital tract during pregnancy, after the period of viability until delivery of fetus is defined as APH [1].

Causes of APH are placenta previa, placental abruption, and unclassified causes. Placental abruption is defined as premature separation of the normally situated placenta before delivery. Abruption can occur any time after 20 weeks of GA, most common in third trimester. Abruption placenta usually manifests as painful vaginal bleeding with tender, irritable uterus associated with fetal distress and maternal vascular compromise. Although causes of abruption are not exactly known, several risk factors such as hypertensive disorders of pregnancy, parity, preterm premature rupture of membranes, multiple pregnancies, hydramnios, smoking, and previous abruption, attribute to it [2,3]. It is a serious obstetric complication with increased maternal peripartum

complications like PPH, needs for blood and blood products transfusion, disseminated intravascular coagulopathy, hepatic and renal failure, pulmonary edema, emergency hysterectomy and maternal mortality and fetal morbidity and mortality.

### METHODS

It is hospital-based prospective observational study done at Government Maternity Hospital, Sultan Bazaar, Koti in 340 antenatal women with hypertensive disorders of pregnancy for period of 2 years.

#### Inclusion criteria

Antenatal women with hypertensive disorders of pregnancy with gestational age >28 weeks of age more than 20 years, patients are diagnosed mainly on clinical signs and symptoms/ultrasound.

#### Exclusion criteria

All patients came with a history of APH due to local causes, placenta previa, unclassified causes, and antenatal women with bleeding disorders.

Careful elucidation of history from the patients with meticulous clinical assessment to exclude placenta previa. Pro forma filled up for every case regarding the following details – age, gravida status,

**Table 1: Age distribution among cases with hypertensive disorders of pregnancy (total -340)**

Age	Frequency among total cases (n-340)	Percentage	Frequency among abruption cases (n-123)	Percentage
21–25 years	107	31.5	84	68.3
26–30 years	153	45	28	22.7
31–35 years	50	14.7	9	7.3
36–40 years	30	8.8	02	1.7
Total	340	100	123	100
Mean age	28.04±4.42 years		24.66±2.31 years	
Antenatal Booking				
Booked	242	71	41	33
Unbooked	98	29	82	67
Parity				
Primigravida	241	70.9	76	61.7
Multi- gravida	99	29.1	47	38.3
Gestational age in weeks				
28–33 weeks	68	20	21	17
34–36 weeks	170	50	68	55
>37 weeks	102	30	34	28
Total	340	100	123	100

gestational age, menstrual history, past, family, and personal history were all recorded. General physical examination was done in every case. Obstetrics examination included per abdominal, per speculum, and per vaginal examinations after USG. Routine investigations were carried out. Specific investigations were carried out when required. Ultrasonography was done and details of viability, gestational age, presentation, placenta, estimated fetal weight, and any gross congenital anomaly were recorded in detail. Management protocol was recorded in terms of chief complaints of the patient, maternal, and fetal condition. Induction if done, mode of delivery, and fetal outcome were all recorded. Mother and baby both were followed up until discharge.

#### Statistical analysis

Data were analyzed by Microsoft Excel and statistical software. Data were summarized by Mean±standard deviation and percentages for categorical data. All  $p < 0.05$  were considered statistically significant.

#### RESULTS

Among 340 cases with hypertensive disorders of pregnancy, of which 153 cases (45%) were between 26 and 30 years, and 107 cases (31.5%) were between 21 and 25 years. The mean age was  $28.04 \pm 4.42$  years. Among the 123 abruptio subjects, 84 cases (63.8%) were between 21 and 25 years. The mean age was  $24.66 \pm 2.31$  years. In the study among 340 cases of antenatal women with hypertensive disorders of pregnancy, 242 (71%) were booked cases and 98 (29%) were un-booked cases. Among 123 cases of abruption, 41 (33%) were booked cases, 82 (67%) were un-booked cases. 340 cases with hypertensive disorders of pregnancy (total -340) consisted of 241 (70.9%) primigravida and 99 (29.1%) were multigravidas. Among 123 cases of abruption, 76 (61.7%) were primigravida and 47 (38.3%) were multi.

In the study among the 340 subjects, 170 cases (50%) were of the gestational ages between 34 and 36 weeks. Among 123 cases of abruption, 21 cases (17%) were of gestational age 28–33 weeks, 68 cases (55%) were of gestational age 34–36 weeks, and 34 cases were more than 37 weeks. The mode of delivery among 123 cases of abruption was 37 cases (30%) had normal vaginal delivery and 86 cases (70%) required cesarean section (Table 1).

In the study, pre-eclampsia (50%) was the most common hypertensive disorder, followed by gestational hypertension (HTN) (30%), eclampsia in 15%, and chronic HTN was seen in 5% (Table 2).

Abruptions were seen in 123 among the 340 subjects. The prevalence rate of abruptions in the study population was 36.1%. Thirty-five cases were of non-severe pre-eclampsia (28.4%), 60 cases were of severe pre-eclampsia (48.8%), 14 cases were of eclampsia (11.3%), 10 cases

**Table 2: Distribution among cases with hypertensive disorders of pregnancy (total -340) based on hypertensive disorder classification**

Hypertensive disorder	Frequency	Percent
Pre-eclampsia	170	50
Severe	105	30.9
Non-severe	65	19.1
Eclampsia	51	15
Gestational hypertension	102	30
Chronic hypertension	17	5
Total	340	100

**Table 3: Distribution of abruption among cases with hypertensive disorders of pregnancy**

Abruptions	Frequency	Percent
Yes	123	36.1
No	217	63.9
Total	340	100
Grade of abruption (n=123)		
Grade 1	66	53.65
Grade 2	36	29.26
Grade 3	21	17.07
Time (n=123)		
<6 h	34	28
6–8 h	60	48
>8 h	29	24
Total	123	100

were of gestational HTN (8%), four cases were of chronic HTN (3.25%) are shown in above Figure 10. Among 123 cases of abruption, 66 cases of Grade 1, 36 cases of Grade 2, and 21 cases of Grade 3 were noted in this study. The time interval from abruption to time of delivery was as <6 h in 34 cases (28%), 6–8 h in 60 cases (48%), and >8 h in 29 cases (24%) (Table 3).

The complications noted among the abruptio (n=123) and non-abruption (n=217) subjects were mainly anemia (70% and 67.7%), PPH (43.3% and 9.7%), hypovolemic shock (24.4% and 3.2%), sepsis (6.5% and 0.4%), blood transfusion (78.8% and 30%), and increased hospital stay (30% and 10.5%), and Couvelaire uterus was seen in two subjects of the abruptio patients as seen in Table 13. On comparison between abruptio and non-abruptio a significant difference was seen with regard to anemia, PPH, hypovolemic shock, blood transfusions, and increased hospital stay (Table 4).

Table 4: Maternal complications among 340 cases of sample

Maternal complications	Abruptio (n=123) (%)	Non-abruptio (n=217) (%)	Total	p-value
Anemia	96 (70)	147 (67.7)	243	0.01*
Postpartum hemorrhage	57 (43.3)	12 (9.7)	69	<0.001*
Hypovolemic shock	30 (24.4)	4 (3.2)	34	0.02*
Sepsis	8 (6.5)	1 (0.4)	9	>0.05
Blood transfusion	97 (78.8)	38 (30)	135	0.01*
>7 days hospital stay	37 (30)	13 (10.5)	50	0.05*
Couvelaire uterus	2 (1.62)	0	2	-
Cesarean hysterectomy	1 (0.8)	0	1	-

\*Level of significance: p<0.05

In this study, the birth weight among 123 cases of abruptio was as follows <1500 g in 31 cases (25%), between 1500 and 2000 g in 26 cases (21.2%), birth weight between 2000 and 2500 g in 48 cases (39%), and >2500 g in 11 cases (8.9%) (Table 5).

The fetal complications majorly noted in the babies born to abruptio mothers were NICU admission, sepsis, and jaundice (87, 1, and 93), respectively. In the non-abruptio babies, few required NICU care and majority of them had jaundice. On comparison between abruptio and non-abruptio, a significant difference was seen with regard to NICU admission (p=0.02) and jaundice (p= 0.04) (Table 6).

The fetal mortality in this study was 7.6%, and the majority (21) of them were born to abruptio mothers and 5 to non-abruptio mothers as shown in Table 13. On comparison between abruptio and non-abruption, a statistically significant difference (p<0.001) was noted suggesting an increased death rate in mothers with abruptio.

## DISCUSSION

In the present study, out of 340 cases with hypertensive disorders of pregnancy, 153 (45%) were between 26 and 30 years, 107(31.5%) were between 21 and 25 years, 50 (14.7%) were between 31 and 35 years and 30 (8.8%) were between 36 and 40 years. The mean age was 28.04±4.42 years.

The present study findings were similar with a study by Halimi Asl *et al.* [4] in which mean age of study subjects was 28.33±6.1 years. The present study findings were similar to a study by Shen *et al.* [5] in which the age of women was 30.3±5 years. The present study findings were similar to a study by Chaitra *et al.* [6] in which 46.15% were in 21–25 years age group, and 34.26% were in 26–30 years of age group. Around 8.39% were <20 years age group and 7.34% were in 31–35 years of age group. In the present study, among 123 cases of abruptio, 112 (76.4%) were between age group of 20 and 30 years, and 11 (23.6%) were above 30 years of age. An earlier study by G. S. Mondal (Calcutta), Mohapatra *et al.* [7] observed that the incidence of abruptio is high among age group between 20 and 30 years followed by above 30 years age group.

In the present study, out of 340 cases with hypertensive disorders of pregnancy, majority 242 (71%) were booked cases and 98 (29%) were un-booked cases, probably due to improvement in government schemes and increasing awareness about schemes of maternal and child care. In the present study, among 123 cases of abruptio, 41 (33%) were booked cases, and 82 (67%) were un-booked cases. Since our hospital is a tertiary care and referral center most cases will be sent with complications. Hence, most of the cases of abruptio were un-booked referred cases. The present study findings were comparable to S. Mondal and Mohapatra *et al.* [7] who had observed similar findings with 70% of un-booked cases of abruptio.

In the present study, among 340 cases with hypertensive disorders of pregnancy, 241 (70.9%) were primigravida and 99 (29.1%) were multi-gravidas, as hypertensive disorders of pregnancy are most common in primigravida women. In the present study with 123 cases

Table 5: Fetal outcome – in terms of Fetal Birth weight among 340 cases of sample

Fetal birth weight	Abruptio (n=123)	Non-abruptio (n=217)	Total (%)
Birth weight			
<1500 g	31	20	51 (15)
1500–2000 g	26	53	79 (23.2)
2000–2500 g	48	83	131 (38.5)
>2500 g	11	61	79 (23.2)
Total	123	217	340 (100)

of abruptio, 76 (61.7%) were primigravida, and 47 (38.3%) were multigravida. The present study findings were comparable with a study by Nankali *et al.* [8] in which 59.6% were primigravida and 40.4% were multiparas. The present study findings were comparable to a study by Wolde *et al.* [9] in which 66.5% of mothers were primigravida and 33.5% were multigravida among abruptio cases.

In this study, among 340 cases of hypertensive disorders of pregnancy, 170 (50%) of the subjects had gestational age between 34 and 36 weeks, and 102 (30%) had gestational age >37 weeks, and 68 (20%) had gestational age between 22 and 33 weeks. In the present study, among 123 cases of abruptio, 21 (17%) were of gestational age between 28 and 33 weeks, 68 (55%) were of gestational age 34–36 weeks, and 34 (28%) were of gestational age above 37 weeks. The present study findings were similar to a study by Nisa *et al.* [2] in which the mean gestational age was 35.95±2.849 weeks.

In the present study, the mode of delivery among 123 cases of abruptio, 37 (30%) had a normal vaginal delivery, and 86 (70%) underwent cesarean section to reduce maternal complications and to improve fetal outcome. According to Sambath *et al.* [10], 70% had cesarean section and 30% had vaginal deliveries. The present study findings were comparable with a study by Nankali *et al.* [8] in which 65.6% required cesarean section and 34.4% delivered through vaginal route. In this study, among 340 cases with hypertensive disorders of pregnancy, pre-eclampsia – 170 cases (50%) had been the most common hypertensive disorder, followed by gestational HTN – 102 (30%), eclampsia – 51 (15%), and chronic HTN – 17 (5%). The present study findings were comparable to a study by Wolde *et al.* [9] in which prevalence of pre-eclampsia – 51.9% of cases among hypertensive cases. In this present study, 123 cases of abruptio, 60 cases (48.8%) were of severe pre-eclampsia, 35 cases (28.4%) non-severe pre-eclampsia, 14 cases (11.3%) were of eclampsia, 10 cases (8%) were of gestational HTN, and 4 cases (3.25%) were of chronic HTN. Severe pre-eclampsia was the most prevalent diagnosis (35.5%), followed by non-severe pre-eclampsia (28.2%), eclampsia (19%), gestational HTN 13.2%, and chronic HTN 4.1% in a study by Seyom *et al.* [11] which were similar to present study findings.

In this study, the prevalence rate of abruptio was 36.1% among 340 cases with hypertensive disorders of pregnancy. In the present study, the complications noted among the abruptio (n=123) and non-abruption (n=217) subjects were mainly anemia (70% and 67.7%), PPH

Table 6: Fetal complications among 340 cases of study population

Fetal complications	Abruptio (n=123)	Non-abruptio (n=217)	Total	p-value
NICU admission	87	89	176	0.02*
Sepsis	1	1	2	>0.05
Jaundice	93	200	293	0.04*
Fetal mortality				
Alive	102	212	314 (92.3%)	<0.001*
Dead	21	5	26 (7.7%)	
Total	123	217	340 (100%)	

\*Level of significance: p<0.05

(43.3% and 9.7%), hypovolemic shock (24.4% and 3.2%), sepsis (6.5% and 0.4%), need for blood transfusion (78.8% and 30%), increased hospital stay (30% and 10.5%), and Couvelaire uterus (1.62% and 0%). On comparison between abruptio and non-abruptio, a significant difference was seen with regard to anemia, PPH, hypovolemic shock, blood transfusions, and increased hospital stay. The present study findings were similar to a study by Jadhav *et al.* [12] in which anemia and PPH were higher among patients with abruptio. The present study findings were comparable to a study by Chaitra *et al.* [6], intraoperative Couvelaire uterus was noted in two women with abruptio and both of them had atonic postpartum hemorrhage managed with blood and component transfusion.

In the present study, the birth weight was <1500 g in 25%, between 1500 and 2000 g in 21.2%, and 2000-2500 g – 39% and >2500 g – 8.9%. The present study findings were comparable to a study by Chaitra *et al.* [6] in which 26.57% of the babies were categorized under low birth weight. In the present study, the fetal complications majorly noted in the babies born to abruptio mothers were NICU admission, sepsis, and jaundice (95.1%, 2.4%, and 86.9%), respectively. In the non-abruptio babies, few required NICU care and the majority of them had jaundice. On comparison between abruptio and non-abruptio a significant difference was seen with regard to NICU admission (p=0.02) and jaundice (p=0.04). In this study, the total fetal mortality rate was 7.6%, and majority 21 cases (80%) of them were born to abruptio mothers, and 5 cases (20%) were born to non-abruptio mothers. On comparison between abruptio and non-abruption, a statistically significant difference (p<0.001) was noted suggesting an increased fetal death rate among babies born to women with abruptio. The present study findings were comparable with a study by Seyom *et al.* [11] in which perinatal mortality was 10.7%.

## CONCLUSION

Abruptio is still one of the most serious obstetric emergencies. Etiology remains obscure in many cases and it often presents without warning. Fortunately, maternal mortality from abruptio has reduced considerably due to the implementation of good obstetric care and blood transfusion services. However, it is still an important cause of maternal morbidity and mortality, and perinatal loss. Elucidation of precise history, etiology, and prevention of abruptio remains the principal challenge of future. Although the incidence cannot be eliminated, care can be taken to decrease the overall incidence and severity of the condition. By avoiding high parity by timely sterilization, improving socioeconomic status, proper antenatal care, anticipation of abruptio in high-risk cases, timely admission, strict surveillance, and prompt action at the time of occurrence can help in bringing better results in dealing with this grave condition. As timing of abruptio is unpredictable, cases prone to pre-eclampsia, and cases of pre-eclampsia have to be paid special attention and addressed with team management when diagnosed as abruptio. Uncorrected anemia in pregnancy is accompanying cofactor in abruptio, leading to an increased need for

blood transfusion, morbidity and mortality of mother. Hence, need for correction of anemia by diet, iron, and folic acid supplementation, availability of injectable iron at the rural level improves the outcome. In India, it is essential to strengthen emergency transport facilities from periphery to tertiary care center as correct intervention at the appropriate time in these patients is crucial for good outcome of pregnancy.

## AUTHOR CONTRIBUTION

No other authors.

## CONFLICTS OF INTEREST

Nil.

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