

## ABRUPTIO PLACENTAE AND ITS COMPLICATIONS AT AYUB TEACHING HOSPITAL ABBOTTABAD

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**Background:** Abruption placentae remains a major cause of perinatal morbidity and mortality globally, though of most serious concern in the developing world. As most known causes of abruption placentae are either preventable or treatable, an increased frequency of the condition remains a source of medical concern. **Methods:** The present study was undertaken at the Department of Obstetrics and Gynaecology, Unit B, of the Ayub Teaching Hospital, Abbottabad, Pakistan, from July 2003 to June 2004. Patients of abruption placentae were selected from all cases of 28 weeks or greater gestation, presenting with ante partum haemorrhage during the study period. Patients underwent a complete obstetrical clinical workup including history, general physical examination, abdominal and pelvic examination. Relevant investigations such as laboratory tests and imaging were performed. Patients were managed according to maternal and fetal condition. Any maternal and/or fetal complications were noted and recorded. All data were collected on predesigned proformas and analyzed by computer. **Results:** A total of 53 cases of abruption placentae were recorded out of 1194 cases (4.4%) admitted for delivery during the study period, giving a rate of 44 cases of abruption placentae per 1000 deliveries. Induction of labour was required in 27 (50.9%) cases, while caesarean section was performed in 16 (30.2%) cases. Major complications were intra uterine fetal demise (31/53, 58.5%), fetal distress (8/22 live births, 36.4%) and post partum haemorrhage, which occurred in 10 (18.9%) cases. **Conclusions:** A higher than expected frequency of abruption placentae exists in our setting and the consequences of abruption placentae for neonatal mortality outcome are alarmingly high. The majority of patients presented with intra uterine death so that any management protocol directed at abruption placentae or its consequences is of little help in preventing perinatal mortality.

**Key Words:** Abruption placentae, ante partum haemorrhage, perinatal mortality.

### INTRODUCTION

Uterine bleeding during the second and third trimesters is a relatively common complication of pregnancy occurring in approximately 4-5% of antenatal patients and, from whatever cause, is associated with an increase in premature births and perinatal deaths.<sup>1</sup> Abruption placentae refers to separation of the normally located placenta after the 20<sup>th</sup> week (28 weeks in our setup) of gestation and before the birth of the fetus.<sup>2</sup> Placental abruption is due to the rupture of the uterine spiral artery.<sup>3</sup> Bleeding into decidua leads to separation of the placenta. Hematoma formation further separates the placenta from the uterine wall, causing compression of these structures and compromise of blood supply to the fetus.<sup>2</sup>

Some of the bleeding of placental abruption usually insinuates itself between the membranes and uterus, and then escapes through the cervix, causing external hemorrhage. Less often, the blood does not escape externally but is retained between the detached placenta and the uterus, leading to concealed hemorrhage. Placental abruption may be total or partial.<sup>4</sup>

Frequency of abruption placentae is about 1% of all pregnancies throughout the world.<sup>2,5</sup> However different studies have reported variable incidence of

abruption placentae ranging from 0.3%<sup>6</sup> to 2%<sup>7</sup> of all term deliveries, while other studies reported incidence of 5.9 per 1000 births<sup>8</sup> to 6.5 per 1000 births.<sup>9</sup>

The etiology of abruption placentae remains obscure but the risk factors implicated include hypertensive disorders of pregnancy, non vertex presentation, Polyhydramnios, intrauterine growth restriction, advanced maternal age, maternal trauma, cigarette smoking, alcohol consumption, cocaine abuse, short umbilical cord, sudden decompression of the uterus, retroplacental fibromyoma, retroplacental bleeding from needle puncture (i.e., post amniocentesis), prior fetal demise, previous miscarriage, grand multiparity, Preterm Rupture of Membranes (PROM), trauma, low pre-pregnancy body mass index, and idiopathic.<sup>2, 5, 6, 8, 10-12, 13-15</sup>

The signs and symptoms of abruption placentae depend on the severity of bleeding and degree of separation of placenta.<sup>2</sup> The common presentations include vaginal bleeding,<sup>2,4,16</sup> uterine and abdominal pain and tenderness,<sup>2,4,16</sup> abnormal uterine contractions,<sup>2,4</sup> premature labour,<sup>2,4</sup> maternal haemodynamic instability,<sup>16</sup> fetal distress,<sup>2,4,16</sup> and fetal death.<sup>2,4,16</sup>

Abruption placentae is a major cause of maternal and perinatal morbidity and mortality.<sup>17</sup> Maternal complications include hemorrhagic shock,<sup>2</sup>

disseminated intravascular coagulation,<sup>2,4</sup> renal failure,<sup>2,4,18</sup> ischemic necrosis of distal organs e.g. hepatic, adrenal and pituitary,<sup>2</sup> uterine apoplexy or Couvelaire uterus leading to postpartum hemorrhage.<sup>4, 18</sup>

Fetal complications include hypoxia,<sup>2,19</sup> anaemia,<sup>2</sup> growth restriction,<sup>2,20,21</sup> prematurity,<sup>2,19,21</sup> neurodevelopmental problems<sup>22</sup> and fetal death.<sup>2,21</sup>

Abruptio placentae is very frequently seen in our population, however local work on this important condition of pregnancy is very sparse. Few studies<sup>23, 24</sup> have reported maternal and fetal morbidity and mortality associated with this condition. No work has been done on abruptio placentae in our setup. This study was undertaken to observe the fetal and maternal outcome of abruptio placentae in Gynae B unit of Ayub Teaching Hospital Abbottabad. The data generated will help to improve maternal and fetal morbidity and mortality by planning prompt management of future cases of placental abruption.

**MATERIAL AND METHODS**

The study was carried out at the Department of Obstetrics and Gynecology Unit B of the Ayub Teaching Hospital Abbottabad; Unit B has a total of 38 beds with approximately 1200 deliveries per year.

The study was carried out for a period of one year from 1<sup>st</sup> July 2003 to 30<sup>th</sup> June 2004. The study population included all cases presenting with ante partum haemorrhage to the Department of Obstetrics and Gynecology Unit B during the study period. Subjects selected for the study were all cases diagnosed as having abruptio placentae.

All study subjects underwent a complete obstetrical clinical workup including history, general physical examination, abdominal and pelvic examination. Relevant investigations such as laboratory tests and imaging were performed. Patients were managed according to maternal and fetal condition. Any maternal and / or fetal complications were noted and recorded. All data were collected on predesigned proformas and entered into the computer program SPSS version 10 for analysis. Data were analyzed for frequencies, proportions, ratios, means and standard deviations. The Chi square and Student's T-tests were used for significance testing as required for qualitative and quantitative data; a  $p \leq 0.05$  was considered significant.

**RESULTS**

A total of 53 cases of abruptio placentae were recorded during the study period out of a total of 1194 cases admitted for deliveries (4.4%), giving a rate for abruptio placentae of 44 cases per 1000

deliveries. These included 19 (35.8%) cases in the year 2003 and 34 (64.2%) cases in the year 2004.

All cases of abruptio placentae presented as unbooked emergencies.

Ages of patients ranged from 18 to 45 years, with a mean age of  $31.55 \pm 6.21$  years (Table 1). The majority of patients (41, 77.4%) belonged to the poor socio-economic group, while the remaining 12 patients (22.6%) were in the middle (satisfactory) socio-economic group (Table 1). There was no case in the upper socio-economic group.

**Table 1: Basic Demographic Data of Patients (n = 53)**

Variables	No. of cases	Percentages	Mean $\pm$ S.D.
<b>Age Groups (Yrs)</b>			
< 25	10	18.9	31.55 $\pm$ 6.21
26-35	29	54.7	
36-45	14	26.4	
<b>Socio Economic Status</b>			
Poor	41	77.4	-
Satisfactory	12	22.6	

Poor = monthly income <Rs. 3000/-, Satisfactory = 3001-10,000/

Obstetric histories of patients are shown in Table 2. Parity of patients ranged from 0 to 11 children, with a mean of  $3.92 \pm 2.56$ . The parity distribution (Table 2) shows 06 patients (11.3%) having parity 0 (Primigravida), 26 patients (49.1%) having parity 1 – 4 (Multigravida) and 21 cases (39.6%) having parity more than 4 (Grand Multigravida).

The gestational ages ranged from 28 to 40 weeks with a mean of  $33.81 \pm 3.64$  weeks. Distribution of gestational ages (Table 2) shows 24 cases (45.3%) in the 28-32 weeks group, 15 cases (28.3%) in the 33-36 weeks group, and 14 cases (26.4%) in the 37 - 40 weeks group.

**Table 2: Obstetric History of Patients (n = 53).**

Variables	No. of cases	Percentage	Mean $\pm$ S.D.
<b>Parity Groups</b>			
0	06	11.3	3.92 $\pm$ 2.56
1 - 4	26	49.1	
> 4	21	39.6	
<b>Gestational Ages (Wks)</b>			
28 – 32	24	45.3	33.81 $\pm$ 3.64
33 – 36	15	28.3	
37 - 40	14	26.4	

Maternal presenting data are shown in Table 3. Bleeding per vaginum was the most frequent presenting complaint accounting for 51 (96.2%) cases, only 2 (3.8%) cases presenting with no vaginal bleeding.

Presentation of patients in labor accounted for 30 (56.6%) cases, while 23 (43.4%) cases did not go into labor.

Premature rupture of the membranes occurred in 11 (20.8%) cases, while 42 (79.2%) did not have rupture of membranes.

**Table 3: Presenting maternal data (n = 53).**

Variables	No. of cases	Percentages	Means ± S.D.
<b>Hypertension</b>			9 cases
SBP > 140mm	09	16.98	168.89 ± 22.05
DBP > 90 mm	09	16.98	108.89 ± 11.67
<b>Bleeding PV</b>	51	96.2	-
<b>In Labor</b>	30	56.6	-
<b>PROM</b>	11	20.8	-
<b>Haemoglobin ≤10.0 gm/dl</b>	51	96.2	7.9 ± 1.1
<b>Delivery</b>			
Vaginal	37	69.8	-
Caesarean	16	30.2	-
<b>PPH</b>	10	18.9	-
<b>Hysterectomy</b>	01	1.9	-

Haemoglobin levels of mothers ranged from 4.0-11.0 gm/dl, with a mean of 7.9 ± 1.1 gm/dl. The haemoglobin distribution showed 51 (96.2%) cases in the 4.0-10.0 gm/dl group, and only 2 (3.8%) cases in the 10.1-13.0 gm/dl group.

Induction of labour was required in 27 (50.9%) cases, while it was not needed in 26 (49.1%) cases.

The mode of delivery was vaginal in 37 (69.8%) cases, while caesarean section was performed in 16 (30.2%) cases.

Post partum haemorrhage occurred in 10 (18.9%) cases, while 43 (81.1%) cases did not have any post partum haemorrhage.

Hysterectomy for controlling post partum haemorrhage was performed in only one (1.9%) case.

There was no maternal mortality in all 53 cases.

Fetal outcome data are shown in Table 4. The neonatal sex was male in 32 (60.4%) cases and female in 21 (39.6%) cases.

There were no audible fetal heart sounds in 31 out of 53 (58.5%) cases while 8 out of the 22 live fetuses (36.4%) cases had heart rates in the 151-170 beats per minute group.

Neonatal APGAR score at one minute was 0 in 31 (58.5%) cases. In the remaining 22 (41.5%) cases, the APGAR score ranged from 2-8. The overall mean APGAR score was 2.64 ± 3.37, while for the 22 cases it was 6.36 ± 1.81. The distribution of APGAR score for the 22 cases was 5 (22.7%)

cases in the 2-4 group, and 17 (77.3%) cases in the 5-8 group.

**Table 4: Fetal outcome data of patients (n = 53).**

Variables	No. of cases	Percentage	Mean ± S.D.
<b>Gender</b>			
Male	32	60.4	-
Female	21	39.6	-
<b>FHR</b>			All cases
No sounds	31	58.5	62.66 ± 75.34
130-150	14	26.4	22 cases
151-200	08	15.1	150.95 ± 9.68
<b>APGAR</b>			All cases
0	31	58.5	2.64 ± 3.37
1-4	05	9.4	22 cases
5-10	17	32.1	6.36 ± 1.81
<b>Mortality</b>			
Baby dead	36	67.9	-
Baby alive	17	32.1	-
<b>Birth Weights (kgs)</b>			All cases
≤ 2.0	30	56.6	2.15 ± 0.87
2.1-4.0	23	43.4	36 dead 1.94 ± 0.82, 17 alive 2.60 ± 0.84*

\*p = 0.009 for weight difference between dead and alive fetuses.

The neonatal weights ranged from 0.8-4.0 kg, with a mean weight of 2.15 ± 0.87 kg. The mean weight of fetuses born alive (17, 32.1%) was 2.60 ± 0.84 as compared to the mean weight of fetuses born dead (36, 67.9%) which was 1.94 ± 0.82. This difference was highly significant, with p=0.009. The distribution of neonatal weights showed 30 (58.5%) cases to be in the up to 2.0 kg group, while 23 (41.5%) cases were in the 2.1-4.0 kg group.

Fetal congenital anomalies were present in only one (1.9%) case.

## DISCUSSION

The results of the present study indicate a much higher than expected frequency of abruptio placentae in our setting.<sup>2,5-7</sup> The only study from Pakistan<sup>23</sup> on the frequency of abruptio placentae gives a figure of 7.18% in Karachi. We have a high frequency because being a tertiary care unit we receive high risk cases and also because of illiteracy our patients have no concept of antenatal checkup so that high risk cases can be detected on time.

It can be said that the frequency obtained in this study is representative of this country. The nearest regional study from Iraq<sup>7</sup> quotes a frequency of 2%.

Abruptio placenta was associated with no maternal mortality but a high frequency of perinatal mortality. The major maternal morbidity was severe to moderate anaemia and renal failure while the major neonatal morbidity was low birth weights related to preterm delivery.

The majority of patients (41, 77.4%) belonged to the poor socio economic group (Table 1). This may be an indication of the referral pattern of poor patients to our hospital rather than a true risk factor. However a poor socio economic status confers a degree of malnutrition and anaemia on patients,<sup>24, 25</sup> which could result in poor placental structure formation, including villi and blood vessels.<sup>26, 27</sup>

Parity of patients is another risk factor in many studies.<sup>5,6,8,10-12,28,29</sup> Multiparity, particularly grand multiparity has been specified as a factor predisposing to increased frequency of abruptio placentae. The number of multiparous females in this study (Table 2) was 47 (88.7%), while primigravida were only 6 (11.3%). Of the multiparous females, 26 (49.1%) were in the multigravida group (1 – 4 children) and 21 (39.6%) were grand multigravida (more than 4 children). Thus the present study would tend to support multiparity as a risk factor for abruptio placentae.

Almost all patients had anaemia, with haemoglobin levels of severe to moderate anaemia in 51 (96.2%) cases (Table 3). The majority of patients (32, 60.4%) had haemoglobin levels between 7.1 – 10.0 gm/dl; 19 (35.8%) had haemoglobin levels from 4.0 – 7.0 gm/dl and only 2 (3.8%) patients had haemoglobin levels between 10.1 – 13.0 gm/dl. The mean haemoglobin level was  $7.9 \pm 1.1$  gm/dl.

This high frequency of maternal anaemia is reflective not only of the bleeding of abruptio placentae but is aggravated by an underlying chronic maternal nutritional deficit common in this country.

The patients in this study had a frequency of hypertension in 16.98% cases (Table 3), and a history of previous hypertensive disorder of pregnancy in 39.6% cases; the actual number of hypertensive patients may have actually been higher keeping in view the history of past hypertensive disorder, but may have been masked by lower blood pressures related to bleeding per vaginum subsequent to abruptio placentae.

The association of abruptio placentae with hypertension has been studied by other authors as well. Abdella et al<sup>30</sup> noted in a study of 265 cases of abruption that the incidence of abruption was highest with eclampsia (23.6%), followed by chronic hypertension (10.0%) and pre eclampsia (2.3%). The study concluded that hypertension is associated with an increased risk of abruption; furthermore the degree

of this increased risk is clearly dependent upon the specific type of hypertensive disorder.

Sharief and Manther in their study<sup>7</sup> compared 50 hypertensive and 104 normotensive cases of abruptio placentae and concluded that there was an increased incidence of abruptio in the hypertensive females of age group 15-20 years, and abruptio placentae grade III occurred significantly more often in the hypertensive group.

The fetal mortality outcome was unexpectedly high as compared to most other studies.<sup>12,20,21,28,29,31</sup> Thirty one (58.5%) patients had intra uterine fetal mortality (Table 4) and a total of 36 (67.9%) neonatal deaths occurred. It is probable that all these deaths occurred due to abruptio placentae or its consequences. High rates of fetal and neonatal mortality have been reported in some studies as well, such as from India<sup>12</sup> and Iraq.<sup>7</sup>

The birth weights of newborns showed a tendency towards lower weights (Table 4). Thirty newborns (56.6%) had birth weights of up to 2.0 kg, while 23 (43.4%) had weights from 2.1 – 4.0 kg. The mean birth weight was  $2.15 \pm 0.87$  kg, though the mean birth weight of dead babies was significantly less than the mean birth weight of live babies. Low birth weights could be attributed to maternal socio economic status, maternal anaemia (chronic malnutrition) and placental bleeding over a few weeks (abruptio placentae).<sup>6,9,25,32</sup>

To conclude, there is no doubt that abruptio placentae represents a potentially serious obstetric problem that tends to threaten fetal viability, neonatal mortality and morbidity and maternal health and well being.

It can be said based upon the present study that there is a high frequency of abruptio placentae in our setting and that the consequences of abruptio placentae for neonatal mortality outcome are alarmingly high. The majority of patients of perinatal mortality presented with intra uterine death so that any management protocol directed at abruptio placentae or its consequences is of little help in preventing perinatal mortality.

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