



## **Risk Factors and Pregnancy Outcome of Placental Abruption at the Niger Delta University Teaching Hospital, Okolobiri, South-South Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author IJA conceptualised the study, and wrote the first draft of the manuscript. Author IJ designed the study, wrote the protocol and performed the statistical analysis. Author AAE collected the data, managed the literature searches. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/BJMMR/2015/12842

#### Editor(s):

(1) Jimmy T. Efid, East Carolina Heart Institute, Brody School of Medicine, Greenville, North Carolina, USA.

#### Reviewers:

(1) Anonymous, PerkinElmer Labs/NTD, USA.

(2) Anonymous, Catholic Maternity Hospital, Nigeria.

(3) Mariano Martin-Loeches de la Lastra, Hospital University San Carlos, Denia (Alicante), Spain.

Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=715&id=12&aid=6594>

**Original Research Article**

**Received 20<sup>th</sup> July 2014**  
**Accepted 13<sup>th</sup> August 2014**  
**Published 22<sup>nd</sup> October 2014**

### **ABSTRACT**

**Aim:** To determine the incidence, predisposing factors, clinical presentation and perinatal and maternal outcome of patients managed for abruptio placenta.

**Study Design:** A retrospective review.

**Place and Duration of Study:** Department of Obstetrics and Gynaecology, Niger Delta University Teaching Hospital, Okolobiri between January 2009 and December 2013.

**Materials and Methods:** Data were collected from records of all patients presenting with abruptio placenta. Information extracted from the records included demographics, parity, gestational age, clinical presentation, risk factors for abruptio placenta, complications, and perinatal and maternal outcome. Data analysis was performed with Epi info version 6.04d. The results are presented as means with standard deviations, percentages, rates and proportions. Association between maternal age and selected obstetric and neonatal variables were assessed using the chi-square and the two-tailed Fisher exact test.

**Results:** A total of 40 cases of abruptio placenta were seen out of 2,736 deliveries giving an

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incidence of 1.46%. Age did not significantly affect the incidence of abruptio placenta in this study ( $p=0.13$ ). High parity was significantly associated with abruptio placenta ( $p = 0.02$ ). Unbooked status and Low socio-economic class were both significantly associated with abruptio placenta ( $p<0.001$ ). Possible abdominal trauma due to traditional abdominal massage was documented in 26 (72.2%) cases and was significantly associated with abruptio placenta ( $p<0.01$ ). There was one maternal death giving a case fatality rate of 2.8%. There were 19 perinatal deaths giving a perinatal mortality rate of 527.7 per 1000 births.

**Conclusion:** Lack of antenatal care and traditional abdominal massage during pregnancy are major predisposing factors to abruptio placenta in our environment. Perinatal mortality associated with abruption placenta is high.

*Keywords: Abruptio placenta; risk factors; abdominal massage; fetal and maternal outcome.*

## 1. INTRODUCTION

Abruptio placenta is separation of the normally situated placenta after the 20<sup>th</sup> week of gestation and prior to birth [1-3]. It accounts for about 30% of third trimester bleeding [1]. It is one of the major causes of obstetric haemorrhage - a common cause of maternal morbidity and mortality [4]. It is also a significant cause of perinatal loss [5].

The exact aetiology of abruptio placenta is unknown but a hypothesis suggests placental or vascular abnormalities due to failure of secondary invasion of trophoblastic villi. Abnormal placentation, vascular malformations and increased fragility of vessels predispose to haematoma formation resulting in separation of the placenta [6]. Risk factors such as high parity, advanced maternal age, low socio-economic class, cigarette smoking, abdominal trauma, alcohol usage, crack cocaine use in pregnancy, maternal hypertension, polyhydramnios, multiple pregnancy, thrombophilias and prior history of abruptio have all been identified [7-9]. Abruptio placenta occurs in 0.8 - 1.0% of all pregnancies and 1.2% in twin pregnancies worldwide [10-13]. It is a major cause of obstetric haemorrhage and perinatal death. The high maternal morbidity and mortality is due to severe haemorrhage that follows this complication. The foetal morbidity and mortality is due to reduced placental surface area for oxygenation [14].

The clinical hallmarks of abruption include painful vaginal bleeding accompanied by tetanic uterine contractions, uterine hypertonicity, and a non-reassuring foetal heart rate pattern [7]. Placental abruption complicates roughly 1 in 100 to 200 (0.5–1%) pregnancies [2,7] and evidence from the United States and Norway indicate that the frequency is increasing [2,10]. The rate of placental abruption varies by gestational age at

delivery with the rate being 10-fold higher at very preterm gestations and sharply declining as pregnancy progresses toward term, with a rate of abruption of 5.4 and 0.3% at preterm and term gestations, respectively [15,16]

In Nigeria, the incidence of abruptio placentae ranges between 0.4% - 0.8% [7,17]. However, there has been no study on abruptio placenta at the Niger Delta University Teaching Hospital [NDUTH] Okolobiri.

This study therefore sought to determine the incidence, predisposing factors, clinical presentation and perinatal and maternal outcome of patients managed for abruptio placenta at the Niger Delta University Teaching Hospital, Okolobiri.

## 2. MATERIALS AND METHODS

This was a five year retrospective analysis of all cases of abruptio placenta seen at the department of Obstetrics and Gynaecology, Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State Nigeria from 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2013. The Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State is a tertiary health institution located in rural Niger Delta region of Nigeria.

The data were collected from the labour ward delivery register, theatre records and the patient's case notes obtained from the main records department. Information extracted from the records included demographics, parity, gestational age, clinical presentation, risk factors for abruptio placenta, complications, and perinatal and maternal outcome. Social class definition followed the recommendations of Olusanya et al. [18] using the woman's level of education and husband's occupation. Data analysis was performed with Epi info ver 6.04d.

The results are presented as means with standard deviations, percentages, rates and proportions. Association between maternal age and selected obstetric and neonatal variables were assessed using the chi-square and the two-tailed Fisher exact test. Differences were considered statistically significant when  $p \leq 0.05$ .

The Niger Delta University Teaching Hospital Ethical Committee provided ethical approval for the study.

### 3. RESULTS

During the study period, a total of 40 cases of abruptio placenta were seen out of a total delivery of 2,736, giving an incidence of 1.46%. Of all deliveries taken in our unit during the study period, 1056 (38.6%) were unbooked emergencies and 1680 (61.4%) were booked. Thus abruption rates were 2.7% and 0.5% among unbooked and booked patients respectively.

In four of the cases of abruptio placenta the records were grossly inadequate and these were therefore excluded from further analysis thus all further analysis was based on 36 cases of abruptio placenta.

Table 1 shows the socio demographic characteristic of the patients. The mean age of the patients was  $28.2 \pm 3.72$  years with the majority (61.1%) of patients were in the age range of 20 – 34yrs. Women who were 35 years or older comprised 22.2% of patients. Age did not significantly affect the incidence of abruptio placenta in this study ( $p=0.13$ ). The mean parity of the patients was  $2.94 \pm 0.52$ . Majority of the women [20(55.6%)] patients were of parity range of 1-4, while 12 (33.3%) were grand multiparous. Only 4 (11.1%) were nulliparae. High parity women were significantly more likely to have than their lower parity counterparts ( $p = 0.02$ ).

Majority of the patients [28, (77.8%)] were not registered for antenatal care while only 8 (22.2%) booked for antenatal care. Of all deliveries taken in our unit during the study period, 1056 (38.6%) were unbooked emergencies and 1680 (61.4%) were booked. Thus abruption rates were 2.7% and 0.5% among unbooked and booked patients respectively. The unbooked patients were significantly more likely to present with abruptio placenta ( $p < 0.001$ ). Low socio-economic class was also significantly associated with abruptio placenta as majority of the patients [32 (88.9%)]

were of low socio-economic class while only 4 (11.1%) were of high socio-economic class ( $p < 0.001$ ).

**Table 1. Socio-demographic characteristics**

| Characteristic              | Number | Percentage (%) | P value |
|-----------------------------|--------|----------------|---------|
| <b>Age</b>                  |        |                |         |
| ≤19                         | 6      | 16.7           | 0.13    |
| 20-34                       | 22     | 61.1           |         |
| ≥35                         | 8      | 22.2           |         |
| <b>Parity</b>               |        |                |         |
| 0                           | 4      | 11.1           | 0.02    |
| 1-4                         | 20     | 55.6           |         |
| ≥5                          | 12     | 33.3           |         |
| <b>Booking status</b>       |        |                |         |
| Booked                      | 8      | 22.2           | <0.01   |
| Unbooked                    | 28     | 77.8           |         |
| <b>Socio-economic class</b> |        |                |         |
| 1                           | 2      | 5.6            | <0.01   |
| 2                           | 2      | 5.7            |         |
| 3                           | 13     | 36.1           |         |
| 4                           | 11     | 30.6           |         |
| 5                           | 8      | 22.2           |         |

Table 2 shows the clinical presentation of the patients. The commonest presenting complaints were vaginal bleeding 32(88.9%). Abdominal pain 29 (80.6%) and labour pains 18 (50%). Others were low back pain 11(30.6%) and history of collapse 8 (22.2%). A history of abdominal trauma due to traditional/culturally based abdominal massage in pregnancy was obtained from 26 (72.2%) of the patients. About one third of the patients [13 (36.1%)] gave a history of habitual ingestion of alcohol. The commonest clinical signs were pallor 32 (88.9%), bleeding per vaginam 31 (86.1%), 'woody hard' uterus 21 (58.3%) and diagnosis of labour was made in 20 (53.6%) patients. The fetal heart sounds were absent in 16 (44.4%) patients. Preterm labour was diagnosed in 13 (36.1%) patients. Hypertensive disorders of pregnancy were noted in 13 (36.1%) patients. Fetal distress occurred in 12 (33.3%).

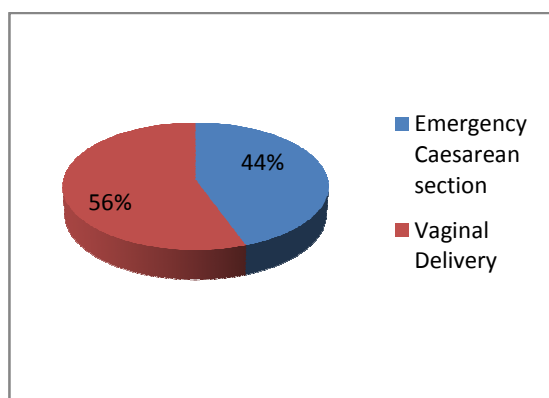
Fig. 1 shows the mode of delivery. Twenty women (55.5%) had spontaneous vaginal delivery, while 16 (44.4%) were delivered by emergency Caesarean section.

Table 3 shows the maternal mortality and morbidity and morbidity associated interventions. Twenty two women (61.1%) went on to develop postpartum haemorrhage, while 29(80.6%) remained anaemic in the post-partum period. Five women (13.9%) developed coagulopathy

while 4 (11.1%) had puerperal sepsis. There was one maternal death in an unbooked woman. This gave a case fatality rate of 2.8%. Cause of death was massive postpartum haemorrhage.

**Table 2. Clinical presentation**

| Clinical presentation                        | Number | Percentage % |
|--|--------|--------------|
| <b>History</b>                               |        |              |
| Vaginal bleeding                             | 30     | 83.3         |
| Abdominal pain                               | 34     | 94.4         |
| Low back pain                                | 12     | 33.3         |
| Labour pains                                 | 19     | 52.8         |
| History of fainting                          | 8      | 22.2         |
| Abdominal massage prior to onset of symptoms | 26     | 72.2         |
| Alcohol ingestion in index pregnancy         | 13     | 36.1         |
| hypertensive disorder in index pregnancy     | 8      | 22.2         |
| <b>Physical examination</b>                  |        |              |
| Pallor                                       | 32     | 88.9         |
| Bleeding per vaginam                         | 30     | 83.3         |
| Diagnosis of labour                          | 20     | 55.6         |
| Woody hard uterus                            | 21     | 58.3         |
| Absent foetal heart sound                    | 16     | 44.4         |
| Foetal parts difficult to palpate            | 14     | 38.9         |
| Elevated Blood pressure                      | 13     | 36.1         |
| Foetal distress                              | 12     | 33.3         |
| Preterm labour                               | 13     | 36.1         |
| Polyhydramnios                               | 2      | 5.6          |



**Fig. 1. Mode of delivery**

There were 19 perinatal deaths giving a perinatal mortality rate of 527.7 per 1000 live births. Of the mortalities, 16 were intrauterine foetal deaths, while 3 were early neonatal deaths. Causes of

death include severe birth asphyxia (n=1), prematurity (n=2).

**Table 3. Maternal morbidity/morbidity-associated intervention and maternal mortality**

| Type                                      | Number | Percentage (%) |
|---|--------|----------------|
| <b>Morbidities</b>                        |        |                |
| Postpartum haemorrhage                    | 22     | 61.1           |
| Cardiovascular shock                      | 10     | 27.8           |
| Anaemia (Postpartum)                      | 29     | 80.6           |
| Coagulopathy                              | 5      | 13.9           |
| Acute renal failure                       | 3      | 8.3            |
| Puerperal sepsis                          | 4      | 11.1           |
| Preterm labour                            | 12     | 33.3           |
| <b>Morbidity associated interventions</b> |        |                |
| Multiple blood transfusion                | 24     | 66.7           |
| Caesarean section                         | 16     | 44.4           |
| <b>Maternal mortality</b>                 |        |                |
| Booked                                    | Nil    | 0              |
| Unbooked                                  | 1      | 2.8            |
| <b>Perinatal mortality</b>                |        |                |
| Stillbirths                               | 16     | 44.4           |
| Early neonatal death                      | 3      | 8.3            |
| Total perinatal deaths                    | 19     | 52.8           |

**4. DISCUSSION**

The incidence of abruptio placenta in our study was 1.46%. This is higher than that obtained at Nnewi, South-East, Nigeria, 0.51% reported in Osogbo, South-West Nigeria and 1.3% reported in Lagos, Nigeria [7,19,20]. It is however far lower than that reported from neighbouring Niger Republic where it is 3.6% [21] and also those from Pakistan where the incidence is generally about 4.0% and may even be as high as 7.0% in some parts of that country [22-24].

In the developing world the high incidence of abruptio placenta has been attributed to lack of antenatal care and low socio-economic status of pregnant women which in turn is associated with anaemia and other untreated medical conditions such as hypertension and diabetes mellitus in pregnancy.

In this study, the higher incidence of abruptio placenta in Bayelsa State compared with other parts of the country may be related to the

traditional practice of abdominal massage during pregnancy. Abdominal massage is an age long practice among obstetric and non-obstetric patients in different parts of the riverine areas of South-South Nigeria especially in Bayelsa State [25]. Abdominal massage as performed by traditional birth attendants in our locality is quite vigorous and intense and often accompanied by significant pain. In our study, 72.2% of the patients presenting with abruptio placenta had abdominal massage performed on them within 72 hours prior to presentation. It is therefore conceivable that abdominal massage is contributory to the higher occurrence of abruptio placenta.

Low socio-economic status and lack of antenatal care were the two other major associations in our study. These two factors are interrelated as pregnant women are required to pay user fees to register for antenatal care. Most of the pregnant women who presented with abruptio placenta did not register for antenatal care and only presented in hospital as obstetric emergencies.

The relationship between these socio-demographic variables and abruptio placenta has been highlighted in similar studies [23-25]. Lack of antenatal care would promote occurrence of risk factors such as uncontrolled hypertensive disorders of pregnancy and ill-advised behaviour of pregnant women such as abdominal massage and use of alcohol in pregnancy [9].

Emergency caesarean section was performed on 16 patients who had abruptio placenta with live babies. Two of the women had Caesarean section for indications other than abruptio placenta, but at surgery retroplacental clots were found and a diagnosis of abruptio placenta was then made. Indications for the caesarean sections were severe pre eclampsia and fetal distress. Managing physicians should be proactive in anticipating the possibility of abruptio placenta when risk factors are present in a pregnant woman. There was only one fresh still birth among those women who had caesarean section, though there was an early neonatal death of a second baby delivered by caesarean section who had moderate birth asphyxia. Caesarean section was promptly carried out once the baby was noticed to be alive, and this may have contributed to the relatively good fetal outcome with emergency caesarean section. The time interval for decision-caesarean section should not be more than 20 minutes for good

fetal outcome as rapid progressive separation of the placenta with time may occur [26].

Postpartum haemorrhage and Postpartum anaemia were the commonest maternal morbidities noted in this study. This is not surprising as both antepartum and postpartum haemorrhages are part of the documented sequelae of abruptio placenta. The frequent occurrence of maternal anaemia has been noted in similar studies [19,20,26,27].

There was one maternal death giving level of case fatality rate of 2.8%. Similar case fatality rates have been recorded in studies from other developing countries [19-24]. The case fatality rate is far less in Europe where it was case fatality rate reported as low as 0.04% [26,27]. The maternal death occurred in a woman who presented very late to hospital in irreversible shock having had massive haemorrhage at home. The scenario related to this patient's death is unlikely in Europe though even in Finland the reported maternal mortality from abruptio placenta was nearly seven times the overall maternal mortality in that country [27].

The perinatal mortality rate from abruptio placenta was 527.7 per 1000 live births (52.8%). This very high rate is comparable to those reported from similar developing countries such as Pakistan (51%) and in Niger Republic (71.3%) [21-24]. Much lower perinatal mortality rates are reported from Europe (9.2%) [8,27]. One of the factors responsible for this high perinatal mortality rate is the poor socio-economic circumstances of these women in developing countries. Most of them were unbooked and arrived late in hospital when abruptio placenta was already severe, making fetal salvage much more difficult.

## 5. CONCLUSION

Low socio-economic class, lack of antenatal care and the traditional/cultural practice of abdominal massage in pregnancy are prominent predisposing factors in abruptio placenta in our setting. The perinatal mortality rates are high. Reduction of the incidence of abruptio placenta is possible with improvement of the socio-economic circumstances of women including formal education and provision of free and accessible antenatal care. Alertness of physicians to the local predisposing factors such as abdominal massage in pregnancy would expedite diagnosis

and treatment and lead to better fetal and maternal outcome.

## CONSENT

Not applicable.

## ETHICAL APPROVAL

The Niger Delta University Teaching Hospital Ethical Committee granted ethical approval for the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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