Chapter 1

INTRODUCTION

Antepartum haemorrhage is defined as bleeding from or into the genital tract occurring from 24+0 weeks of gestation or after fetal viability and prior to birth of the baby. The most important causes of antepartum haemorrhage are placenta previa and placenta abruption. Antepartum haemorrhage complicates 3-5% of pregnancies and is a leading cause of perinatal and maternal mortality worldwide (1). Locally and for the purpose of this study the definition of antepartum haemorrhage will refer to bleeding from or into the genital tract occurring after 28 weeks of gestation prior to delivery of the baby. This is because our neonatal units are not well resourced to enable neonates born before 28 weeks to survive.

The obstetric causes of antepartum haemorrhage include placenta abruption, placenta previa, heavy show, vasa previa and uterine rupture. Non-obstetric causes include cervicitis, cervical neoplasm, cervical polyp, trauma or other malignancies which are not very common in occurrence.

Placenta previa is one of the major causes of antepartum haemorrhage and is defined as a placenta overlying or proximate to the internal os. It can be sub classified by ultrasonography into complete, partial, marginal and low-lying. Low-lying placentae are also associated with an increased risk of bleeding and possibly other adverse outcomes, although less than the true placenta previa (2)(3). Practically, an abnormally located placenta is best described sonographically as either completely covering os or the ultrasound scan report should indicate the
number of millimetres/centimetres between the inferior edge of the placenta and internal os of the cervix (4). Incidence of placenta previa at term is approximately 0.5% (5). Risk factors include prior caesarean delivery, previous uterine surgery (myomectomy, dilatation and curettage, hysteroscopy) involving the uterine cavity, prior placenta previa and multiparity (6)(7)(8). Characteristic clinical presentation is painless vaginal bleeding. This occurs in 70-80% of patients, while an additional 10-20% of women present with uterine contractions with associated bleeding and less than 10% are incidentally detected by ultrasound and remain asymptomatic (9)(10).

Placenta abruption is defined as premature separation of a normally implanted placenta. Approximately 0.5-1% of all pregnancies is complicated by this condition (11). Incidence in the United States has recently increased, especially in the African-American population, the ethnic group at highest risk of severe grade 3 placenta abruption (12). Typically it presents with bleeding, painful uterine contractions and fetal demise. Aetiology is not completely understood but it appears to occur as a result of two mechanisms; mechanical separation or as a result of defective deep placentation (13). Placental separation occurring in association with mechanical trauma or rapid decompression of a distended uterus is believed to occur due to shearing forces resulting from a change in surface area of a relatively elastic uterine wall in relation to an inelastic placenta. Evidence in support of a defective deep placentation mechanism comes from placental biopsies from cases of placental abruption which show an absence of physiologic trophoblastic invasion, dilated vessels and recent thrombosis of spiral arteries (14). Risk factors for placenta abruption includes history of abruption in previous pregnancy, maternal hypertensive disorders, abdominal trauma, smoking, cocaine use, previous caesarean section,
polyhydramnios, multiple gestation, chorioamnionitis, vaginal bleeding before 20 weeks and advanced maternal age. It can be graded as table 1 below.

Table 1: Grading of Placenta abruption

<table>
<thead>
<tr>
<th>Grade</th>
<th>Clinically evident bleeding</th>
<th>Uterine tenderness</th>
<th>Maternal Hypotension</th>
<th>Maternal coagulopathy</th>
<th>Fetal distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td>Yes or No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Yes or no</td>
<td>Yes</td>
<td>No</td>
<td>Rare</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Yes or no</td>
<td>Yes</td>
<td>Yes</td>
<td>Often</td>
<td>Death</td>
</tr>
</tbody>
</table>

Source: Adapted from Ref 15

Placenta abruption and placenta previa account for more than 50% of cases of antepartum haemorrhage (placenta previa 20%, placenta abruption 30%), while other causes contribute the remainder of the proportion. However, sometimes the cause of antepartum hemorrhage may be indeterminate. Placenta previa and abruption are among the major contributors to perinatal and maternal morbidity and mortality in the 3rd trimester.
RESEARCH QUESTIONS

A- What is the incidence and what are the maternal and perinatal outcomes for patients managed for antepartum Haemorrhage at Harare Maternity Hospital?

B- Are patients presenting with Antepartum Haemorrhage managed according to a standard protocol?
Chapter 3

STATEMENT OF PROBLEM

Antepartum Haemorrhage is one of the leading causes of maternal and perinatal mortality and morbidity in Zimbabwe. Information from Maternity delivery registers and Neonatal Deaths Register (Harare Central Hospital) in 2013 revealed that 5 out of 77 maternal deaths were due to antepartum haemorrhage and all cases were noted to be avoidable (unpublished data). Currently the contribution of antepartum haemorrhage to maternal morbidity and mortality at Harare Maternity Hospital is not known.
Chapter 4

LITERATURE REVIEW

Obstetric haemorrhage remains one of the major causes of maternal death in developing countries and is the cause of up to 50% of estimated 395000 maternal deaths occurring globally each year (16). In 2006-8 report of the UK confidential Inquires into maternal deaths, haemorrhage was the sixth highest direct cause of maternal death (17). In UK and USA haemorrhage is the leading cause of admission of pregnant women into the intensive care unit (18). In first world countries death from obstetric haemorrhage is rare while in countries with fewer resources, the contribution of haemorrhage to maternal mortality is more striking (19). In the 2005-2007 report of the confidential enquiries into maternal deaths in South Africa, obstetric haemorrhage was the third most common cause of death accounting for 12.4% of all deaths; there was a total of 108 deaths from antepartum haemorrhage and 74 (68.5%) were considered to be clearly avoidable (20). A study done on maternal and perinatal mortality published in 2007 by the ministry of health and child welfare showed that antepartum haemorrhage was the seventh most common cause of maternal deaths (3.1%) in Zimbabwe (21). Haemorrhage emerges as the major cause of severe maternal morbidity in almost all near-miss audits in both developed and developing countries (22).

There have been a lot of studies which have been done to assess complications of antepartum haemorrhage. In a retrospective case-control study done in Nigeria by Adenkale and others between January 2005 and December 2008 comparing the pregnancy outcomes of mothers treated for antepartum haemorrhage with a control
group of age matched women who were not managed for the condition. The incidence was 1.5% and significant maternal and neonatal complications were noted. These included maternal anaemia, blood transfusion, prolonged hospital stay and higher caesarean deliveries (63.9% in cases vs. 39% in the controls, p value < 0.05) while neonatal complications included birth asphyxia, admission to neonatal intensive care unit and perinatal death (23).

A retrospective study carried out in India over a period of 1 year on 226 women done by Singhal and others in 2008 showed that the incidence of APH which was 3.01%. Maternal and perinatal morbidities were noted to be very high with increased rates of anaemia and the caesarean section rate. They concluded that there is a very high maternal and perinatal morbidity and mortality in antepartum haemorrhage (24).

Maurya and others in 2014 looked into factors associated with antepartum hemorrhage, maternal and perinatal outcomes of patients managed for antepartum haemorrhage at Kamla Raja Hospital. They reviewed 100 cases and found that placenta previa contributed 71%, placenta abruption 27% and 2% of cases were undetermined. They also concluded like in other studies that antepartum haemorrhage is a major contributor to maternal and perinatal morbidity. They also noted that it could be prevented by early booking, regular antenatal care, early detection of high risk cases and early referral to higher centres (25). This study showed that placenta previa and abruption contributed 98% of cases of antepartum haemorrhage which is not in keeping with most studies done on this subject.

Abegbola and others in 2009 studied the pattern of antepartum haemorrhage at Lagos University Teaching Hospital and found an incidence of antepartum haemorrhage of 3%. Placenta previa had an incidence of 2.0% and constituted
58.4% of the causes of antepartum haemorrhage, followed by placenta abruption with an incidence of 1.3%, constituting 35.6%. They also found out that early pregnancy bleeding before 20 weeks and preeclampsia/ eclampsia were most commonly associated with placenta previa and abruption respectively. They concluded that antepartum haemorrhage remains a dangerous complication of pregnancy with high maternal and perinatal morbidity and mortality (26).

In a cross sectional study done in Karachi by Siddiqui and others between August 2007 and July 2009 in which they compared perinatal outcomes and near miss morbidities between placenta previa and placenta abruption - results showed that Stillbirth and perinatal mortality rates were significantly higher in placenta abruption 52.97% vs. 18.18% and 534/1000 vs. 230/1000 respectively and subsequently concluded that abruption placenta carries a significantly higher perinatal mortality and near miss morbidities than placenta previa (27).

The studies seem to concur that antepartum haemorrhage is associated with high maternal and perinatal morbidity and mortality. There is also a variation in the incidence of antepartum haemorrhage in different populations.
4.1 LOCAL GUIDELINES ON MANAGEMENT OF ANTEPARTUM HEMORRHAGE

Management of antepartum haemorrhage at Harare Maternity Hospital is based on a protocol in the Essential Guide to Management of Common obstetric and gynaecological conditions in Zimbabwe. The protocol acts as a standard and guide to the management of the condition. The study audited the management of the condition. Below is the description of the protocol which is used by resident, senior house officers and registrars in managing antepartum hemorrhage cases.

Management of antepartum haemorrhage will involve:

1) History

2) Examination

If bleeding is severe and life threatening

- resuscitate immediately with 1-2 intravenous lines using at least 16G cannula and run ringers lactate or normal saline fast to bring blood pressure up

- catheterise

- 500 to 1000mls of heamacel while awaiting blood

- blood for cross match, Haemoglobin level, platelet count

- crude clotting time

- give blood as required

- give fresh frozen plasma if bedside clotting prolonged (>10 minutes)

- if anaesthetist available consider CVP line to avoid fluid overload
If clinically placenta abruption

- perform vaginal examination
- if cervix fully dilated deliver vaginally
- if cervix not fully dilated
  (i) with fetus alive and estimated gestational age > 32/40, perform caesarean section
  (ii) if fetus is dead or of non-viable gestation perform ARM and start oxytocin, aim to deliver within 6-8 hours

If placenta previa confirmed by previous scan

- perform caesarean section

If not confirmed placenta previa or not placenta abruption

- perform caesarean section

At delivery: Give intravenous 0.5mg ergometrine or 5 units oxytocin and add 20 units of oxytocin in 1 Litre ringer’s lactate/normal saline and run at 30 drops/min until patient stable and ensure uterus remains well contracted.

If bleeding is mild to moderate and not life threatening

- admit ELW for bed rest
- monitor pulse, blood pressure, Fetal heart rate, pad and contraction checks
- Blood for haemoglobin concentration, grouping
- sedation may be required if patient anxious
-perform USS

If bleeding is not placenta previa then observe- discharge after 24 hours after bleeding has stopped. Advise not to have sexual intercourse for two weeks. Advise to return immediately if recurrence. Await spontaneous labour.

If bleeding continues but not severe

-keep in hospital

-Full blood count

-give haematinics

-fetal growth

-Kick chart

-Induce at term

If placenta previa with estimated gestational age > 37/40 - major placenta previa or grade 2b perform caesarean section. Minor (grade 1, 2a) and bleeding is minimal induce labour if cervix is favourable or wait for spontaneous labour if cervix is unfavourable

If estimated gestation age is < 37 weeks then keep in hospital until bleeding has stopped and then manage as outpatient.

Monitor daily pad checks

-fetal movements/ fetal heart

-weekly Haemoglobin
-keep 2 units of blood cross matched

Repeat Uss at 32-34 weeks and again later before planning definitive mode of delivery (28)
Chapter 5

JUSTIFICATION

Management and outcomes of patients with antepartum haemorrhage have not been assessed at Harare Maternity Hospital despite continuous unavailability of adequate staff and resources and worsening economic environment. There is no study which has been published locally concerning antepartum hemorrhage. Results from the study will help in the future management of patients and help synthesise management drills for the condition. It was justified to do this study because antepartum haemorrhage is a significant contributor to maternal and perinatal morbidity and mortality. Assessment of the outcomes will help in changing policies and therefore improve maternal and neonatal health care.
Chapter 6

OBJECTIVES

1) To assess the incidence of antepartum haemorrhage at Harare Maternity Hospital.

2) To assess the maternal and perinatal morbidity associated with antepartum haemorrhage.

3) To assess the maternal and perinatal mortality associated with antepartum haemorrhage.

4) To evaluate the management rendered to patients presenting with antepartum haemorrhage at Harare Maternity Hospital.
Chapter 7

RESEARCH METHODOLOGY

7.1 Study design

Prospective Cross sectional Study (observational).

7.2 Study setting

The study was conducted at Harare Maternity Hospital, a tertiary hospital which is the main referral centre for the greater Harare Unit, district and provincial hospitals. It is also a teaching hospital of the University Of Zimbabwe College Of Health Sciences. Council clinics which are part of the Greater Harare Unit manage patients regarded to be low risk pregnancies and therefore refer all cases of antepartum Haemorrhage to Harare Maternity Hospital. The hospital comprises of an admission unit, antenatal ward, early labour ward, labour ward, two theatres, postnatal ward A (for vaginal deliveries), postnatal ward B (for caesarean deliveries) and a neonatal unit. Patients with antepartum haemorrhage are managed in early labour where they are closely monitored and if they are stable, not warranting delivery, they are transferred to antenatal ward. Neonates born with complications are quickly admitted to the neonatal unit for management. Harare Maternity hospital attends deliveries ranging from 1000 to 1500 per month. Ten to 18 caesarean deliveries are performed every day.
7.3 Sample size calculation

Sample size was calculated using this formula

\[
N = \frac{Z^2 \cdot p(1-p)}{e^2}
\]

Where \( n = \) sample size

\[Z^2 = (1.96)^2\] for 95% confidence (i.e. \( \bar{p} = 0.05\))

\( p = \) best guess for prevalence (0.03). This is based on a study quoted in the literature review done by Abegbola on patterns of antepartum haemorrhage in Nigeria, an African population which is comparable to our local population.

\( e = \) maximum tolerable error for the prevalence estimate (± 0.030) because prevalence is estimated to be less than 5%.

Table 2: Sample size calculation

<table>
<thead>
<tr>
<th>Z</th>
<th>Z²</th>
<th>p</th>
<th>(1-p)</th>
<th>p(1-p)</th>
<th>e</th>
<th>e²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.96</td>
<td>3.8416</td>
<td>0.03</td>
<td>0.97</td>
<td>0.0291</td>
<td>0.03</td>
<td>0.0009</td>
<td>124.2117</td>
</tr>
</tbody>
</table>

The sample size for the study was 125.

7.4 Inclusion criteria

(i) All women admitted and managed for antepartum haemorrhage after 28 +0 completed weeks of gestation who deliver at the hospital.

(ii) women who consented to take part in the study.
7.5 Exclusion criteria

Women with the following characteristics were excluded from the study

(i) Unwilling to consent to take part in the study.

(ii) Multiple pregnancies.

(iii) Congenital abnormalities.

7.6 Study factors

Study factors evaluated included demographic data, antepartum haemorrhage causes, antenatal ultrasound scan assessment, mode of delivery, use of non-pneumatic antishock garment, operative interventions, postpartum haemorrhage, transfusion, duration of hospital stay, admission to intensive care unit, maternal death and also neonatal outcomes which included: live births, apgar score less than 7 after 5 minutes, admission to neonatal unit, preterm delivery, birth weight and death. A standard based audit was designed from the local protocol for evaluating the management of antepartum haemorrhage. This is illustrated in table 3 below.
Table 3: Criteria and Standard audit tool

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A- Patient managed for antepartum haemorrhage</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Insertion of 2 large bore cannulas for resuscitation</td>
<td>100%</td>
</tr>
<tr>
<td>(ii) Full blood count</td>
<td>100%</td>
</tr>
<tr>
<td>(iii) Cross match of blood</td>
<td>100%</td>
</tr>
<tr>
<td>(iv) Crude clotting time</td>
<td>100%</td>
</tr>
<tr>
<td>(v) Catheterisation</td>
<td>100%</td>
</tr>
<tr>
<td>(vi) Active management of third stage of labour for all cases</td>
<td>100%</td>
</tr>
<tr>
<td><strong>If patient managed for placenta abruption</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Delivery within 6-8 hours</td>
<td>100%</td>
</tr>
</tbody>
</table>

7.7 Data Collection

Data collection was done on women who met the inclusion criteria using non-probability convenience sampling after they had been admitted at Harare Maternity Hospital. Recruitment of mothers was done upon delivery after they had been managed for antepartum haemorrhage. Once selected for the study, each patient would go through the process of informed consent and signed the consent form. Data was collected by the principal investigator aided by two assistants (midwives based in early labour ward). Information from the patient was collected from the patient notes and then filled in a data collection form.

The diagnosis of each case was made by the team of doctors managing the women upon admission. A diagnosis of placenta previa was based on clinical presentation of
painless bleeding in the presence of a relaxed uterus, retrospective confirmation of placental site after delivery (for example upon doing a caesarean section) or a low lying placenta confirmed by ultrasound scan. A diagnosis of placenta abruption was based on clinical parameters of bleeding associated with uterine contractions and tenderness, +/- fetal distress or fetal death and or confirmation after delivery of a retroplacental clot. Diagnosis of other causes of antepartum haemorrhage was based on clinical findings depending on the particular cause.

There was no intervention to the management of the patient and decisions made were solely based on the team managing the patient or the team on call. After delivery in early labour ward women were discharged to postnatal wards if stable. Follow-up of the mothers was done until they were discharged from hospital. Upon delivery neonates were either given to the mother or admitted in neonatal unit if indicated. Neonates were followed up to day 28 post delivery. This was made possible by calling the parents about a month after they had been discharged from hospital to find out if the child was alive and well and also to account for any possible complications which would have arisen after leaving hospital.

7.8 Data management and analysis

Data was entered into the data collection form and the principal investigator checked the completeness and correctness of the data. Data collected was entered into a statistical package SPSS version 16 and analysed. Chi-square test was used to compare categorical variables and T-test used for continuous variables and a p value of ≤0.05 was considered significant.
7.9 Ethical considerations

(i) Consent and confidentiality

Consent forms were prepared in English and Shona languages and then administered to the participants. Participants signed if they had agreed to take part in the study and those who did not wish to take part in the study were excluded and were not penalised. Data collected was confidential and there were no identifying features on data collection forms. Data was stored in a secure office which was only accessible to the researcher and staff only. It was later entered in a computer which was password protected for analysis.

(ii) Approval from Ethics Committees

Approval from Joint Research Ethics Committee (JREC), Medical Research Council of Zimbabwe (MRCZ) and Harare hospital Ethics research committees was obtained.
Chapter 8

RESULTS

During the study period from August to December 2014, 129 women were managed for antepartum hemorrhage. Four women were removed from the analysis. Two had gestational age less than 28 completed weeks, one did not consent to take part in the study and one woman had multiple pregnancy. One hundred and twenty five (125) were available for the final analysis. During the same period there were 6033 deliveries at the hospital and the incidence of antepartum hemorrhage was 2.1% for the study period. The causes of antepartum hemorrhage were placenta abruption 49 (39.2%), placenta previa 44 (35.2%), indeterminate 18 (14.4%), heavy show 12 (9.6%) and ruptured uterus 2(1.6%). The latter three causes were grouped into one pool of causes noted as, “Other” for further analysis. This group contributed 25.6% to the causes. Figure 1 below highlights the causes of antepartum hemorrhage.

Figure 1

Causes of Antepartum Hemorrhage

![Bar chart showing the causes of antepartum hemorrhage. Placenta abruption at 39.2%, placenta previa at 35.2%, indeterminate at 14.4%, heavy show at 9.6%, and ruptured uterus at 1.6%. The other category includes 25.6% of cases.](image-url)
8.1 Demographic data

a) Age distribution

The mean age was 29 years, the youngest being 17 years and the oldest being 43 years old. Most of the women were between 20 and 35 years constituting about 79.2% of the study population. Table 4 below shows the age distribution.

Table 4: Age Distribution

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>5</td>
<td>11.4%</td>
<td>4</td>
<td>8.2%</td>
</tr>
<tr>
<td>20-35</td>
<td>33</td>
<td>75.0%</td>
<td>39</td>
<td>79.6%</td>
</tr>
<tr>
<td>&gt;35</td>
<td>6</td>
<td>13.6%</td>
<td>6</td>
<td>12.2%</td>
</tr>
</tbody>
</table>

P=0.822

b) Marital status

Most of the subjects were married constituting 96.8% and only 3.2% were single.

Table 5 shows the marital status of the study participants.

Table 5: Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Single</td>
<td>0</td>
<td>0.0%</td>
<td>4</td>
<td>8.2%</td>
</tr>
<tr>
<td>Married</td>
<td>44</td>
<td>100%</td>
<td>45</td>
<td>91.8%</td>
</tr>
</tbody>
</table>
c) **Level of education**

All 125 women had attained some form of education. Nine percent had gone to school up to grade seven. The majority had done school up to ordinary level, 82.8%. Only 8.2% had done Advanced level and tertiary education.

Table 6 below shows level of education.

**Table 6: Level of Education Status**

<table>
<thead>
<tr>
<th>Level Of Education</th>
<th>Placenta previa</th>
<th>Placenta abruption</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Grade 7</td>
<td>2</td>
<td>4.5%</td>
<td>9</td>
<td>18.4%</td>
</tr>
<tr>
<td>O level</td>
<td>38</td>
<td>86.4%</td>
<td>36</td>
<td>73.5%</td>
</tr>
<tr>
<td>A level</td>
<td>0</td>
<td>0.0%</td>
<td>4</td>
<td>8.1%</td>
</tr>
<tr>
<td>Tertiary</td>
<td>4</td>
<td>9.1%</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

8.2 **Obstetric History**

a) **Parity**

The majority of women were para twos who constituted 31.2% followed by para ones contributing 28.8%. Nulliparous women contributed 20% while very few women fell into the ≥4 parity group constituting 6.4%. Table 7 below highlights parity distribution and figure 2 shows it graphically.
### Table 7: Parity

<table>
<thead>
<tr>
<th>Parity</th>
<th>Placenta previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>0</td>
<td>8</td>
<td>18.2%</td>
<td>13</td>
<td>26.5%</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>36.4%</td>
<td>10</td>
<td>20.4%</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>29.5%</td>
<td>16</td>
<td>32.7%</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>11.4%</td>
<td>6</td>
<td>12.2%</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>4.5%</td>
<td>3</td>
<td>6.1%</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
<td>2.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

0.657

### Figure 2

**Frequency of Parity**

![Graph showing frequency of parity](image)
a) Booking status

Most of the subjects in the study were booked (76%) and on the other hand 24% were unbooked. Table 8 and figure 3 shows booking status in the study population.

<table>
<thead>
<tr>
<th>Booking Status</th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Booked</td>
<td>36</td>
<td>81.8%</td>
<td>35</td>
<td>71.4%</td>
<td>24</td>
</tr>
<tr>
<td>Unbooked</td>
<td>8</td>
<td>18.2%</td>
<td>14</td>
<td>28.6%</td>
<td>8</td>
</tr>
</tbody>
</table>

**Figure 3**

Pie Chart for Booking Status
b) HIV status

Majority of women were HIV negative 84 (67.2%). The remainder of the proportion were almost equally divided into those who were HIV positive and those who did not know their status (16% and 16.8% respectively). Table 9 shows HIV status.

Table 9: HIV Status

<table>
<thead>
<tr>
<th>HIV Status</th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Negative</td>
<td>30</td>
<td>68.2%</td>
<td>31</td>
<td>63.2%</td>
<td>23</td>
</tr>
<tr>
<td>Positive</td>
<td>7</td>
<td>15.9%</td>
<td>9</td>
<td>18.4%</td>
<td>4</td>
</tr>
<tr>
<td>Unknown</td>
<td>7</td>
<td>15.9%</td>
<td>9</td>
<td>18.4%</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 4
c) Parity, Gravidity, EGA and ANC visits

The mean estimated gestational age at delivery was 35 weeks with a standard deviation of 5 weeks, with a range of 28 to 43 weeks of gestation for all cases of antepartum haemorrhage managed during the study period. Table 10 shows parity, gravidity, estimated gestational age and antenatal visits characteristics.

Table 10: Parity, Gravidity, EGA and ANC visits

<table>
<thead>
<tr>
<th></th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>*Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity (mean ±SD)</td>
<td>1.4 ±1.1</td>
<td>1.5 ±1.2</td>
<td>1.6 ±1.2</td>
</tr>
<tr>
<td>Gravidity (mean ±SD)</td>
<td>2.6 ±1.1</td>
<td>1.6 ±1.4</td>
<td>2.7 ±1.2</td>
</tr>
<tr>
<td>EGA at booking (mean in weeks ±SD)</td>
<td>24.0 ±5.0</td>
<td>28.0 ±5.0</td>
<td>25.0±5.6</td>
</tr>
<tr>
<td>ANC visits for booked women (mean visits ±SD)</td>
<td>3.2 ±2.0</td>
<td>2.5 ±1.5</td>
<td>3.2 ±2.5</td>
</tr>
<tr>
<td>EGA at delivery (mean in weeks ±SD)</td>
<td>36.0 ±4</td>
<td>34.0 ±4</td>
<td>35.0 ±5</td>
</tr>
</tbody>
</table>

Table 11: Assessment of antenatal visits for booked women

<table>
<thead>
<tr>
<th>ANC Visits</th>
<th>Placenta Previa (n=36)</th>
<th>Placenta Abruption (n=35)</th>
<th>Other (n=24)</th>
<th>Total (n=95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1-2</td>
<td>11</td>
<td>20</td>
<td>8</td>
<td>39</td>
</tr>
<tr>
<td>3-5</td>
<td>21</td>
<td>11</td>
<td>14</td>
<td>46</td>
</tr>
<tr>
<td>&gt;5</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

P=0.602
8.3 Management of antepartum haemorrhage

a) Mode of delivery

Vaginal deliveries occurred in 63 (50.4%) of women whilst 62 (49.6%) women had caesarean sections done. Fifteen (30.6%) of women managed for placenta abruption had caesarean section done with the main indication for the procedure being the clinical diagnosis and presence of a fetal heart. This resulted in 13 of these cases resulting in delivery of live neonates. The Odds ratio for women managed for placenta previa to deliver by caesarean section was 2.80 (95% CI 1.98-3.96), whilst women managed for placenta abruption had an odd ratio of 0.57 (95% CI 0.36-0.89) and other diagnoses was 0.466 (95% CI 0.28-0.79). Table 12 shows mode of delivery.

Table 12: Mode of delivery

<table>
<thead>
<tr>
<th></th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Vaginal</td>
<td>6</td>
<td>13.6%</td>
<td>34</td>
<td>69.4%</td>
</tr>
<tr>
<td>Caesarean</td>
<td>38</td>
<td>86.4%</td>
<td>15</td>
<td>30.6%</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>50.4%</td>
<td>62</td>
<td>49.6%</td>
</tr>
</tbody>
</table>

b) Ultrasound scan assessment

Assessment of ultrasound scans done antenatally showed that 53.6% had at least one ultrasound scan done during the current pregnancy and 46.4% had none done. Table 13 shows frequency of participants who had ultrasound scans done antenatally.
Table 13: Frequency of Ultrasound Scan done antenatally

<table>
<thead>
<tr>
<th>Obstetric USS</th>
<th>PLACENTA PRAEVENTA</th>
<th>PLACENTA ABRUPTIO N</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Done</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>27.3%</td>
<td>27</td>
<td>55.1%</td>
</tr>
<tr>
<td>Done</td>
<td>32</td>
<td>72.7%</td>
<td>22</td>
<td>44.9%</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P=0.10

c) Standard based audit

Active management of third stage of labour was assessed in 98.4% (p value- 0.492) while crude clotting time was assessed in 15.7% (p value - 0.007) of participants.

Table 14 shows the complete evaluation of the parameters assessed in evaluating management of antepartum haemorrhage in the unit and this can be further highlighted graphically as shown in figure 5.

Table 14: Evaluation of antepartum haemorrhage management in the unit

<table>
<thead>
<tr>
<th></th>
<th>Placenta Previa n=44(%)</th>
<th>Placenta Abruption n=49(%)</th>
<th>Other n=32(%)</th>
<th>Total</th>
<th>Percentage</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion of 2 Large bore cannula</td>
<td>42 (95.5%)</td>
<td>42 (85.7%)</td>
<td>15 (46.9%)</td>
<td>99</td>
<td>79.2%</td>
<td>0.000</td>
</tr>
<tr>
<td>Full Blood Count</td>
<td>43 (97.7%)</td>
<td>47 (95.9%)</td>
<td>20 (62.5%)</td>
<td>112</td>
<td>89.6%</td>
<td>0.000</td>
</tr>
<tr>
<td>Cross Matching</td>
<td>39 (88.6%)</td>
<td>41 (83.7%)</td>
<td>16 (50.0%)</td>
<td>96</td>
<td>76.8%</td>
<td>0.000</td>
</tr>
<tr>
<td>Catheterisation</td>
<td>43 (97.7%)</td>
<td>37 (75.5%)</td>
<td>14 (43.8%)</td>
<td>94</td>
<td>75.2%</td>
<td>0.000</td>
</tr>
<tr>
<td>Crude Clotting time done</td>
<td>2 (4.5%)</td>
<td>13 (26.5%)</td>
<td>4 (12.5%)</td>
<td>19</td>
<td>15.2%</td>
<td>0.007</td>
</tr>
<tr>
<td>Active management of 3rd stage of labour done</td>
<td>44 (100%)</td>
<td>49 (100%)</td>
<td>31 (96.9%)</td>
<td>124</td>
<td>98.4%</td>
<td>0.492</td>
</tr>
<tr>
<td>Delivery within 6-8 hours for women with placenta abruption</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>69.4%</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Figure 5: Bar graph showing Target and Achieved proportion for each parameter
8.4 Maternal Outcomes

The table 15 below outlines the maternal outcomes for the 125 cases analysed in the study. Case Fatality for the study was 4%. Maternal deaths occurred as a result of placenta abruption which had a case fatality of 10.2% for the condition. There were no repeat laparatomies done post caesarean sections.

Table 15: showing Maternal Outcome measures

<table>
<thead>
<tr>
<th></th>
<th>Placenta Previa n=44 (%)</th>
<th>Placenta Abruption n=49(%)</th>
<th>Other n=32(%)</th>
<th>Total n=125</th>
<th>Percentage</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum Haemorrhage</td>
<td>18 (40.9%)</td>
<td>25 (51.0%)</td>
<td>7 (21.9%)</td>
<td>50</td>
<td>40.0%</td>
<td>0.036</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>0</td>
<td>2 (4.1%)</td>
<td>2 (6.3%)</td>
<td>4</td>
<td>3.2%</td>
<td>0.000</td>
</tr>
<tr>
<td>*Brace sutures during caesarean sections</td>
<td>7 (18.4%)</td>
<td>1 (6.7%)</td>
<td>0</td>
<td>8</td>
<td>12.9%</td>
<td>0.004</td>
</tr>
<tr>
<td>Repeat laparotomy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Antishock garment use</td>
<td>0</td>
<td>5 (10.2%)</td>
<td>0</td>
<td>5</td>
<td>4.0%</td>
<td>0.012</td>
</tr>
<tr>
<td>Transfusion</td>
<td>18 (40.9%)</td>
<td>22 (44.9%)</td>
<td>1 (3.1%)</td>
<td>41</td>
<td>32.8%</td>
<td>0.010</td>
</tr>
<tr>
<td>Intensive Care Unit Admission</td>
<td>0</td>
<td>3 (6.1%)</td>
<td>1 (3.1%)</td>
<td>4</td>
<td>3.2%</td>
<td>0.008</td>
</tr>
<tr>
<td>Maternal Deaths</td>
<td>0</td>
<td>5(10.2%)</td>
<td>0</td>
<td>5</td>
<td>4.0%</td>
<td>0.028</td>
</tr>
</tbody>
</table>

*Denominator = caesarean sections done for each group

8.4.1 Duration of hospital stay

The mean duration of hospital stay for women managed for antepartum haemorrhage was 5.2 days in placenta previa, 3.4 days for placenta abruption and 2.5 days for other diagnoses of antepartum haemorrhage. This is outlined in table 16 below.
### Table 16: Hospital stay duration

<table>
<thead>
<tr>
<th></th>
<th>Placenta Previa</th>
<th>Placenta Abruption</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (days)</td>
<td>5.2</td>
<td>3.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>2.5</td>
<td>3.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Minimum (days)</td>
<td>3.0</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Maximum (days)</td>
<td>15.0</td>
<td>21.0</td>
<td>8.0</td>
</tr>
</tbody>
</table>

### 8.5 Fetal Outcomes

Of the 125 cases of antepartum haemorrhage analysed, there were 84 (67%) live births. Placenta previa had the highest number of live births 41 (93.2%). Placenta abruption had the most stillbirths 35 out of the 49 cases (71.4%). There were 9 early neonatal deaths out of the 84 live births recorded. There were 51 (40.8%) perinatal deaths which occurred overall for the antepartum haemorrhage cases. Perinatal mortality rate for placenta previa was 159, placenta abruption 755 and 188 for other diagnoses (per 1000 total births). A quarter of live babies born had an apgar of less than seven (p-value-0.757). Forty five (53.6%) of live births were admitted to the neonatal unit. Neonates were followed up until day 28 post delivery by calling the parents and finding out if they were alive and well. Out of the 84 live births, there were 9 early neonatal deaths, 63 were alive and well after 28 days and 11 cases (13%) were lost to follow-up because the cell phone numbers could not get through. The average birth weight for the neonates was 2400 grams, with a range of 950 to 3600 grams. Table 17 shows fetal outcomes.
Table 17: Fetal Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Placenta Previa n=44(%)</th>
<th>Placenta Abruption n=49(%)</th>
<th>Other n=32(%)</th>
<th>Total n=125</th>
<th>Percentage</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live Birth</td>
<td>41 (93.2%)</td>
<td>14 (28.6%)</td>
<td>29 (90.6%)</td>
<td>84</td>
<td>67.2%</td>
<td>0.000</td>
</tr>
<tr>
<td>Preterm delivery</td>
<td>21 (47.7%)</td>
<td>24 (48.9%)</td>
<td>11 (34.4%)</td>
<td>56</td>
<td>44.8%</td>
<td>0.250</td>
</tr>
<tr>
<td>Still births (macerated + fresh still births)</td>
<td>3 (6.8%)</td>
<td>35 (71.4%)</td>
<td>3 (9.4%)</td>
<td>41</td>
<td>32.8%</td>
<td>0.000</td>
</tr>
<tr>
<td>Early Neonatal deaths</td>
<td>4 (9.1%)</td>
<td>2 (4.1%)</td>
<td>3 (9.4%)</td>
<td>9</td>
<td>*10.7%</td>
<td>0.640</td>
</tr>
<tr>
<td>Perinatal deaths</td>
<td>7 (15.9%)</td>
<td>37 (75.5%)</td>
<td>6 (18.6%)</td>
<td>51</td>
<td>40.8%</td>
<td>0.000</td>
</tr>
<tr>
<td>Neonatal deaths</td>
<td>6 (14.6%)</td>
<td>2 (14.3%)</td>
<td>3 (10.3%)</td>
<td>11</td>
<td>*13.1%</td>
<td>0.230</td>
</tr>
<tr>
<td>Admission to Neonatal Unit</td>
<td>24 (58.5%)</td>
<td>8 (57.1%)</td>
<td>13 (44.8%)</td>
<td>45</td>
<td>*53.6%</td>
<td>0.294</td>
</tr>
<tr>
<td>Apgar score &lt; 7 after 5 minutes</td>
<td>13 (29.5%)</td>
<td>4 (28.6%)</td>
<td>4 (13.7%)</td>
<td>21</td>
<td>*25%</td>
<td>0.757</td>
</tr>
</tbody>
</table>

*denominator is live births
Chapter 9

DISCUSSION

Mean age of the study participants was 29 years, which lies within the age group 20-35 years, the major proportion of the reproductive age group. This is in contrast to the traditional association of antepartum haemorrhage with advanced maternal age (34)(35)(36). Mean parity in the study was 1.4±1.1 for placenta previa and 1.5±1.2 for placenta abruption which was much lower than that found by Siddiqui and others which was 3.13±2.59 and 3.33±2.77 respectively (27). Of note was that women who were more or equal to para 4 on presentation were just 6.4%. High parity has always been associated with greater risk of antepartum haemorrhage, this was contrary to results found in the study.

Women managed for placenta previa had more antenatal visits, 3.2±2 as compared to 2.5±1.5 for placenta abruption. The optimum number of antenatal care visits for countries with limited resources is still subject of considerable debate, the problem being linked not only with effectiveness but also cost and other barriers to antenatal care visits (30). However, the general consensus is that all women with uncomplicated pregnancies should have a minimum of 4 visits as outlined by WHO (31)(32). In recent years, there has been a shift in thinking from high risk approach to focused or goal orientated antenatal care services which provide specific evidence-based interventions for all women especially when carried out at certain critical times during pregnancy (45)(46).
The incidence of antepartum haemorrhage was 2.1% which is within the range recorded in studies in developed countries which is 2 ‒ 5% (32). This was a lower incidence as compared to 3.01% and 3 % found by Singhal and Abegbola respectively in studies assessing maternal and perinatal outcomes (24)(26). An incidence of 1.5%, which was much lower, was found in a Nigerian study by Adenkale (23). This may signify variation in the incidence of the condition in these hospital based studies.

The commonest cause of antepartum haemorrhage in the study was placenta abruption (n=49) contributing about 39% followed by placenta previa 35.2% (n=44) while other causes contributed about 26.5%. This was contrary to findings in other studies. Chan and others found that main causes of antepartum haemorrhage were placenta previa 31%, placenta abruption 22% with other causes contributing 47%(33). Agegbola in 2009 looked at patterns of antepartum haemorrhage at a teaching hospital in Lagos, Nigeria and found that placenta previa contributed 58.4% and abruption contributed 35.6% (26). This was also similar in another study in Nigeria by Adenkale which showed that placenta previa contributed 55.6%, placenta abruption 33.3% and unknown causes proportion 8.4%(23). This may signify that the contribution of the causes of antepartum haemorrhage may differ depending on the region and population studied. Since the major cause of antepartum haemorrhage in the study was placenta abruption there might be need to do a study to assess the risk factors contributing to this major cause in our population.
Maternal morbidity outcomes in the study revealed that 40% of women had postpartum haemorrhage. When the three groups were compared, postpartum haemorrhage occurred in 25(51%) of placenta abruption cases, 18 (40.9%) of placenta previa and other diagnoses of antepartum haemorrhage were least likely to have postpartum haemorrhage 7(21.9%) with a p-value of 0.036. This is supported by other studies which have shown that antepartum haemorrhage arising from placenta previa and placenta abruption is associated with increased risk of postpartum haemorrhage (43)(44). In a study by Maurya and others in which they reviewed 100 cases of antepartum haemorrhage the proportion of postpartum haemorrhage was 21.49% much lower than that found in this study (25).

Five women with placenta abruption had non pneumatic antishock garment used on them, this accounting for just 4% usage for all antepartum haemorrhage cases and three of these required intensive care unit admission. This may signify the fact that most patients did not have severe hemorrhagic shock warranting its use and admission to a high care unit. In a systematic review by Castro and others, they concluded that non pneumatic antishock garment is a temporary alternative measure in postpartum haemorrhage management that shows a trend to reduce postpartum related deaths and severe morbidities (47). Therefore, non pneumatic antishock garment can aid management of antepartum haemorrhage.
Caesarean hysterectomies were done in 4 cases (3.2%). Two of the cases had severe haemorrhage because of complications of placenta abruption and the other two had ruptured uterus which could not be repaired. Women with ruptured uterus may present as antepartum haemorrhage and are at risk of maternal morbidity and mortality. Clinical suspicion should result in aggressive management in order to reduce severe complications. Of note in the study is that there were no repeat laparatomy post caesarean sections. Repeat laparatomies may be expected post caesarean sections because of the high risk of postpartum haemorrhage secondary to low contractility of the lower segment and morbidly adherent placentas.

Women who were managed for placenta previa and placenta abruption were more likely to have transfusion of blood products (40.9% and 44.9% respectively) as compared to the pooled group of other diagnoses (3.1%). High rates of postpartum haemorrhage in the study might explain the necessity noted to transfuse these women. The overall proportion of cases transfused was 32.8%; which was much higher as compared to that found by Adenkale and others, in a study in Nigeria which was 12.4% (23).

The case fatality rate for the study was 4%. This was as a result of five maternal deaths because of placenta abruption and its complications. All the cases had estimated blood loss of at least 1500mls with associated coagulation disorders. A review of the cases showed that the deaths could have been avoided if there was availability of blood products at the blood bank. This occurred later on during the course of the study when donated blood coupons ran out and patients were unable
to receive blood products unless if they had paid for them. Two of the cases had also other co-morbidities, one being managed for type one diabetes and the other one was HIV positive being managed for gastroenteritis upon presentation to the unit.

Placenta abruption was associated with a high perinatal morbidity and mortality as compared to placenta previa or pooled group of other diagnoses as highlighted by 24(48.9%) preterm births, 35(71.4%) still births and 37(75.5%) perinatal deaths. This may signify the fact that patients presenting with placenta abruption were mostly class 3, which is the severe form of the disease. Perinatal mortality rate for placenta previa was much lower than that for placenta abruption (159 vs. 755 per 1000 total births). This is supported by a study by Siddiqui done in Karachi, in which it was noted that stillbirth and perinatal mortality rates were significantly higher in placenta abruption than placenta previa (27).

There were more live births in women with placenta previa 41 (93.2%) and pooled group of other diagnosis 29 (90.6%) as compared to 14 (28.6%) for placenta abruption (p-value 0.000). It was of interest to note the proportion of live births in placenta abruption which was 14(28.6%). Thirteen of these live births were delivered through caesarean sections with the main indication for the procedure being the diagnosis of placenta abruption and presence of a viable fetus. The unit is underequipped in terms of a readily available ultrasound scan and cardiotocogram which may aid in management. Despite the lack of this essential equipment, delivery of 14 live births in cases with placenta abruption shows a good degree of clinical acumen of the managing teams.
More than half of live births (53.6%) were admitted in the neonatal unit. However, 25% of these had an Apgar less than 7 after 5 minutes. Major reasons for admission to neonatal unit in the study included low Apgar, prematurity and low birth weight. This was highlighted in the study which showed 44.8% of cases to be preterm deliveries and mean birth weight of 2400 grams. A study by Adenkale showed that admission to Neonatal unit for cases of antepartum haemorrhage was 33.3% in Nigeria (23). This proportion was much lower than that recorded in the study.

A standard based audit was included in the study to assess the management of antepartum haemorrhage. Full blood count and active management of the 3rd stage of labour (89.6% p-value 0.000 and 98.4%, p-value 0.492 respectively) were the only parameters done which attained at least 80% achievement of the target. Full blood count is an important investigation in managing antepartum haemorrhage as it helps in assessing the baseline haemoglobin content. High proportion of achievement on management of the 3rd stage of labour could be attributable to the good midwifery and obstetric practice in the unit. A Cochrane review found that active management of third stage of labour was associated with lower maternal blood loss and with reduced risks of postpartum haemorrhage (48). However, there were a high proportion of cases (40%) that ended up having postpartum haemorrhage despite active management. This may be explained by the already high risk of postpartum haemorrhage associated with antepartum haemorrhage as compared to uncomplicated pregnancy deliveries.
The least achieved parameter was crude clotting time, assessed in only 15.2% of cases. Women diagnosed with placenta abruption may have disseminated intravascular coagulation as a complication. Despite this only 13 (26.5%) of placenta abruption cases were assessed for this parameter and it was hardly assessed in the other diagnoses. The full clotting profile was hardly ordered by the managing teams and laboratory facilities for this test are not always available.

In the management of antepartum haemorrhage cases insertion of two large bore cannulas, cross matching of blood and catheterisation are crucial steps which should be done. In this study these parameters were achieved in between 70 to 80% of cases. This could be contributed to by the unavailability of resources in the unit, in which some essential items are in and out of supply. Achievement of less than 80% for cross matching of blood in the management of antepartum haemorrhage cases is unacceptable because of known complications like postpartum haemorrhage and known high risk and need for transfusion in these cases.

Women managed for placenta abruption who delivered with 6-8 hours as outlined in the local guidelines were 34 (69.4%). Hence, it can be said that management of these cases were not strict as per protocol which may have contributed to high maternal and perinatal morbidity and mortality when it was compared to other diagnoses. Also of note was that, the group of causes of antepartum haemorrhage which excluded placenta previa and abruption had less likelihood of having the ideal management. This was highlighted by the results which showed that (insertion of 2 large bore cannulas, cross matching, catheterisation and crude clotting time) was
done in less than 50% of these cases. This could have resulted in the substandard management of these patients as they are susceptible to complications as well. However, the majority of these women did not have serious complications as compared to placenta previa and abruption.

Improvement in the management of antepartum haemorrhage could be done by making resources available as well exposing health care providers to obstetric drills. CEMACH, the RCOG, Royal College of Midwives have recommended obstetric drills or skills drills which include management of antepartum haemorrhage (39). Sequential reports investigating maternal deaths in the United Kingdom have highlighted the importance of obstetric haemorrhage skill drills (40)(41). A prospective randomised trial from UK demonstrated that practical, multiprofessional training in the management of obstetric emergencies increases midwives’ and doctors’ knowledge (42).

Sixteen percent of women in the study were HIV positive and 16.8% did not know their status when they presented to the hospital. This high percentage of women who were not aware of their status could be attributed to the fact that a sizeable proportion 24% was unbooked upon presentation to the unit. The unit has a nurse and counsellor trained in HIV testing and counselling instituting provider initiated testing and counselling. However, they are unavailable during the night and weekends leading to women with antepartum haemorrhage presenting and delivering without knowing their HIV status. Despite following up the women till discharge there was no effort made in HIV testing and counselling post delivery.
WHO estimated that the prevalence of HIV was approximately 15% (range 14.2%-15.7%) in Zimbabwe in 2013. This was comparable to the results found in the study.

Half of the women in the study were delivered by caesarean section with the majority of placenta previa cases being delivered by caesarean section (86.4%). However, a relatively lower caesarean section rate for cases of placenta abruption in the study 30.6%, was comparable to those found by other authors, Sarwar et al found 30.2% (37) and Bibi et al found 27% (38). The high caesarean section rate in placenta previa may be attributable to major haemorrhage upon presentation of the cases. Our local guidelines suggest a caesarean section delivery for placenta previa cases if bleeding is severe and life threatening and diagnosis having been confirmed by a previous ultrasound scan (28).
Chapter 10

10.1 CONCLUSION

The study showed an incidence of antepartum haemorrhage of 2.1% in women who delivered at Harare Maternity Hospital. There was considerable maternal and perinatal morbidity and mortality attributable to antepartum haemorrhage. There were gaps in adhering to the management protocol.

10.2 Limitations to the Study

(i) Diagnosis of cases in the study was at the discretion of the different teams managing the women at the particular point at which they presented to the unit.

(ii) The study could only capture information which had been recorded in the case notes. There were gaps in documentation of some case notes resulting in missing of important information.

(iii) Postpartum haemorrhage assessment was based on estimates. This could have resulted in inter observer variation and underestimation of actual blood loss. The study was poorly funded to obtain material to accurately measure blood loss.

(iv) Follow up of neonates could only be done by phoning the mothers. Assessment of well being could have been done better by doing home visits and physically examining the neonates. The study was underfunded to fully do this process.
10.3 Recommendations

(i) Obstetric drills to be instituted at the unit to all incoming and those already in the unit (midwives and doctors) so as to improve management of antepartum haemorrhage cases and basing it on the already available guideline.

(ii) There should be a constant availability of blood products from the blood bank so as to reduce maternal mortality.

(iii) An ultrasound scan machine for use by midwives and doctors must be available in the admissions ward all the time facilitating prompt diagnosis and management of antepartum haemorrhage cases.

(iv) Aggressive management of antepartum haemorrhage in the unit will help achieve millennium development goal 5, proposed by the World Health Organisation in order to improve maternal and newborn health in the country.
REFERENCES


18 Gilbert TT, Smulian OC, Martin AA. *Obstetric admission to the intensive care unit, Outcomes and severity of illness*: Obstetrics and Gynaecology, 2003. 102.


Subject Informed Consent

PROTOCOL TITLE:
MANAGEMENT AND OUTCOMES IN WOMEN WITH VAGINAL BLEEDING BEFORE DELIVERY OF THE BABY AT HARARE MATERNITY HOSPITAL- PROSPECTIVE CROSS SECTIONAL STUDY (OBSERVATIONAL)

NAME OF RESEARCHER: DR SYDNEY FARAYI
PHONE: 0772876056

PROJECT DESCRIPTION
This study will aim to determine the proportion of women with vaginal bleeding prior to delivery that are admitted and treated in the unit. It will also evaluate the treatment rendered to the women as well as to assess mother and newborn outcomes of women with vaginal bleeding prior to delivery.

YOUR RIGHTS
Prior to your decision to take part or not for the study, you must understand the purpose of this study, how it may help you, risks to you and what is expected of you. This process is called informed consent.
PURPOSE OF RESEARCH STUDY

The purpose of the study is to determine the proportion of women with vaginal bleeding prior to delivery who deliver at the hospital. It will also evaluate the treatment rendered to the women and also assess maternal and newborn complications associated with vaginal bleeding prior to delivery.

PROCEDURES INVOLVED IN THE STUDY

The study will involve following you up upon recruitment. The researcher will not do anything to you or intervene in the management of your pregnancy. Decisions on treatment during your pregnancy, delivery and post delivery will be done by the team of doctors that will be taking care of you or the team that will be on duty. Tests done will be done according to the team managing you at that particular time. Information will be collected about you upon delivery and follow-up will be done until you and/or your baby has been discharged from the hospital.

DISCOMFORTS AND RISKS

PHYSICAL HARM

There will not be any harm expected to happen to you after participating in the study.

PSYCHOSOCIAL HARM

There will be invasion of privacy. In the case of bad outcome during or after delivery there will be stress associated with collection of information about the bad experiences. Information collected will be confidential. Data will be stored in a secure office which will only be accessible to the researcher and their staff only. It will later be entered in a computer which is password protected for analysis. No personal identifying information will be recorded on data collection.

POTENTIAL BENEFITS

No benefits will be gained from participating in the study. However, there may be benefit to you in subsequent pregnancy if you are managed at the same institution.
STUDY WITHDRAWAL

It is your choice to enter or withdrew from the study at any time without any loss of benefits entitled to you. If you decide not to participate, your decision will not affect your future relations with Harare Maternity Hospital and its personnel. If you decide to participate you are free to withdrew your consent and discontinue participation at any time without penalty.

CONFIDENTIALITY OF RECORDS

Information collected from you will be confidential and stored in a secure place and only accessible to the researcher and staff. No personal identifying information will be recorded on the data collection tools.

PROBLEMS/QUESTIONS

You are free to ask questions about the research or consent now.

You can contact DR SYDNEY FARAYI for further information

If you feel you have been treated unfairly and would like to talk to someone other than a member of research team, please feel free to contact the Medical Research Council of Zimbabwe(MRCZ) or telephone 04 791792 or 04 791193 and cell phone lines 0772433166 or 0779439564. MRCZ offices are located at National Institute of Health research premises at Corner Josiah Tongogara and Mazowe Avenue in Harare.

AUTHORIZATION

I have read this paper about the study or it was read to me. I understand the possible risks and benefits of this study. I know being in this study is voluntary. I choose to be in this study. I know l can stop being in the study and I will not lose any benefits entitled to me. I will get a copy of this consent form.

Client signature Date

Researcher Signature Date

Title: Management and outcomes of women with vaginal bleeding prior to delivery at Harare Maternity Hospital.
Appendix 2

SHONA CONSENT FORM

P.O. Box A178
Avondale,
Harare
Zimbabwe

Telephone: 263-4-707707/731000
Fax: 263-4-794272/621345
Telegrams: UNIVERSITY
Email: obsgynpari@zol.co.zw

UNIVERSITY OF ZIMBABWE
Department Of Obstetrics & Gynaecology

GWARO RECHIVUMIRANO

Musoro wechirongwa:
Chirongwa chekuongorora kurapwa kunoitwa madzimai anobuda ropa panguwa yekuzvitakura nezvinozoitika kuhutano hwamai pamwechete nemwana mushure mekurapwa pachipatara che Harare Maternity.

Zita remuongorori: Dr SYDNEY FARAYI
Runhare rwavo: 0772876056

TSANANGUDZO YECHIRONGWA
Chirongwa ichi ndechekuongorora huwandu hwemadzimai anobuda ropa panguwa yekuzvitakura vanorapwa pa chipatara. Chichange chichizoongorora zvekare kuti madzimai aya anenge arapwa nemutoo upi pane zvakawiriranwa kuti vanorapwa sei uye nekuzoona kuti chii chinozoitika kuna mai nemwana mushure mekunge varapwa dambudzikoro iri.

KODZERO DZENYU
Musati masarudza kana kuramba kusarudza kupinda muchirongwa chino munofanirwa kunzwisisa chinangwa chechirongwa chino. Munofanifanira kuve neruziwo kuti chirongwa ichi chingakubatsirai sei uye neruziwo zvinhu zvinogona kukukuvadzai pamwechete ne zvinotarisirwa kubva kwamuri. Uku ndiko kunonzi kusarudza munhu uine ruziwo.
DONZVO RECHIRONGWA

Donzvo rechirongwa nderekuda kuona hwemadzimai anouya achirapwa mushure mekunge vabuda ropa panguva yekuzvitakura. Donzvo iri richaoongorora zvekare kuti madzimai aya arikumborapwa nenzira ipi uye chii chinozitika kana varapwa dambudziko iri uyezve nekuona zvinoita kumwana anenge achizobarwa.

ZVICHAITWA KANA MAPINDA MUCHIRONGWA


Tinoramba tichiona kuti murikupora sei kusvika mabuditswa muchipatara imi pamwechete nemwana wenyu.

NJODZI YEKUKUWARA PAMUVIRI WENYU

Hapana njodzi inotarisirwa kuti ingaitike pamuviri wenyu nekuda kwekupinda muchirongwa chino.

KUSHUSHIKANA NEKUPISHANA KWEPFUNGWA

Mibvunzo yese yatichakubvunzai nekunyora pasi zvichange zviri pakati pedu nemi, hazvizoshambadzwa kuruzhinji. Mibvunzo iyi inogona kusanganisira zwaiitika kwamuri nekumwana izvo zvinogona kukonzeresa kushushikana mumwoyo menyu nekuti zvinenge zvichangobva kuittika. Umboo uchawanikwa huchanochengedwa muhofisi isingasvikwi nevanhu veruzhinji, zvinoziswa mu computer inenge yakachengetedza nesvombonono inozivikanwa nemuungorori nevanoshanda naye chete.

ZVAMUNGANGOWANA

Hapana zvamuchawana kana mukasarudza kupinda muchirongwa
KUBUDA MUCHIRONGWA

Munogona kupinda muchirongwa kana kubuda panguwa ipi zvayo yamunenge maona kuti zvakakodzera pasina rasikirwo yezvamuchange muchawana pakurwapwa kwenyu. Sarudzo yenyu haizokanganisa hukama hwenyu nechipatara che Harare Maternity kana vashandi.

ZVAKAVANZIKA

Zvichange zvanyorwa zvese zvichange zviri pakati penyu nemuongorori nevamwe vake.
Zvichakotswa kune ruzhinji rwevanhu uye hapana zvichanyorwa zvinogona kuzopedzisira zvaita kuti muzivikanwe kuti ndimi mune zvatarwa pasi.

WEKUONA KANA MUINE MUBVUNZO KANA ZVINONETSA

Tinokumbira kuti mubvunze mibvunzo pamusoro pegwaro iri kana mazota mibvunzo munguva dzinovera munofanira kuona CHIREMBA SYDNEY FARAYI kana kuvachaira runhare panhamba dzinoti 0772876056 nguwa ipi zvayo.

Kana mukaona kuti hamuna kubatwa zvakanaka uye munoda munhu wekutaura naye asiri ari mutsvakiridzo iyi, makasununguka kubata veku Medical Research Council of Zimbabwe (MRCZ) or runhare 04 791792 kana 04791193 kana mbozhanhare dzinoti 0772433166 kana kuti 0779439564. Mahofisi e MRCZ anow anikwa pazvivakwa zve National Institute of Health research panobatana mugwagwa wa Josiah Tongogara na Mazowe mune Harare.
MVUMO


Sainecha yemudzimai ari kuda kupinda muchirongwa __________________________

Zuva
_____/_______/________

Sainecha yemuongorori __________________________

Zuva
_____/_______/________

Musoro wechirongwa:

Chirongwa chekuongorora kurapwa kunoitwa madzimai anobuda ropa panguwa yekuzvitakura nezvinozitika kuhutano hwamai pamwechete nemwana mushure mekurapwa pachipatara che Harare Maternity.
Data Collection Form

Client number:

Diagnosis:
- Placenta previa
- Placenta abruption
- Other: Mention the diagnosis _________________________________________________________

Demographic data

Age [ ]

Level of education

Grade 7 [ ]
O level [ ]
A level [ ]
Tertiary [ ]

Occupation ________________________________________________________________

Parity: [ ]

Gravidity: [ ]

Booking status:

Booked [ ] Estimated gestation age at booking [ ]
If booked number of ANC visits [ ]

HIV status: Negative [ ]  Positive [ ]  Unknown [ ]

EVALUATION OF MANAGEMENT

Vital Signs on Admission  
BP [ ] mmHg
TEMPRETURE [ ] degrees Celsius
PULSE [ ] beats/minute

Mode of delivery
Vaginal
Caesarean section [ ]

Decision to deliver [ ] made by
Midwife [ ]
SRMO [ ]
SHO [ ]
Registrar [ ]
Consultant [ ]

Patient with antepartum Haemorrhage

2 large bore Cannula Yes [ ]
No [ ]

Full blood count Yes [ ]  If Yes initial Hb [ ]  Platelet [ ]
No [ ]

Xmatch Yes [ ]
No [ ]

Catheterisation Yes [ ]
No [ ]

Crude Clotting time Yes [ ]  if done [ ] minutes
If managed for placenta abruption

(i) **Assessment of cervical favourability**
- Cervical dilatation
- Cervical length
- Position of cervix
- Consistency of the cervix
- Effacement

(ii) **Delivery within 6-8 hours**  Yes [  ]

   No [  ] If no state duration[  ] hours

Delivery Done by
- Midwife [  ]
- SRMO [  ]
- SHO [  ]
- Registrar [  ]
- Consultant [  ]

**Active Management of third stage of labour** Done [  ]

   Not Done[  ]

**MATERNAL OUTCOME MEASURES**

**Primary Postpartum Haemorrhage**

- Vaginal delivery Estimated blood loss >500mls
- Caesarean section >1000mls
- Any blood loss causing patient incapacities

**Operative intervention other than caesarean section**

- Hysterectomy
- Brace sutures
- Repeat laparotomy

**Antishock garment**  Used [  ]

   Not Used [  ]
Transfusion  
Yes [ ] if yes what product was transfused

| Blood | |  
| Platelets | |  
| Fresh frozen plasma | |  

No [  ]

Admission soon after delivery to

| Intensive Care Unit |  
| Early labour Ward / HDU |  
| Postnatal Ward |  

Duration of hospital stay  
[  ] days

Maternal death  
Yes [ ]  No [ ]

FETAL OUTCOME MEASURES

Adverse fetal outcome (perinatal death)  
Yes [ ]  No [ ]

If baby born alive

Prematurity (EGA <37 completed weeks)  
Yes [ ]  No [ ]  EGA _____

Apgar score after 5 minutes  
[  ]

Admission to neonatal unit  
Yes [ ]  No [ ]

Duration of Hospital stay  
[  ] days