

**RISK FACTORS OF ANTEPARTUM HAEMORRHAGE AT KENYATTA NATIONAL
HOSPITAL: A CASE CONTROL STUDY**

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AWARD OF DEGREE IN MASTERS OF MEDICINE IN OBSTETRICS AND
GYNAECOLOGY**

DECLARATION

I, the principal researcher, declare that this dissertation is my original work, carried out under the guidance of my supervisors, and with the help of my research assistants. References made to work done by others have been indicated.

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DEDICATION

This book is dedicated to Dr. Arnold Bugah, my husband, for your unwavering support. You held my hand and never let go even when I wanted you to. To my parents Margaret and Geoffrey and Sisters Benita and Claudia, for your endless support and encouragement in your own individual ways.

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LIST OF ABBREVIATIONS

APH..... Antepartum Haemorrhage

APHUO..... Antepartum Haemorrhage of Unknown Origin

RCOG..... Royal College of Obstetricians and Gynaecologists

ART..... Assisted Reproductive Technology

CD..... Caesarean Delivery

MoH..... Ministry of Health

KNH..... Kenyatta National Hospital

UoN..... University of Nairobi

WHO..... World Health Organization

DALYs.... Disability Adjusted Life Years

SOPs..... Standard Operating Procedures

SDGs..... Sustainable Development Goals

ABSTRACT

Risk Factors of Antepartum Haemorrhage at Kenyatta National Hospital: A Case Control

Study

Background

Antepartum haemorrhage (APH) is one of the major causes of maternal and perinatal morbidity and mortality. It occurs in 3-5% of pregnancies and is one of the major causes of preterm births. It also contributes to “near miss” cases in both high resource and low resource countries. This study is designed to determine the risk factors of APH. The prompt diagnosis and appropriate management of antepartum haemorrhage would greatly reduce the maternal and perinatal morbidity and mortality associated with obstetric haemorrhage.

Objective: To determine the risk factors of antepartum haemorrhage among mothers who receive intrapartum and/or postpartum care at Kenyatta National Hospital.

Study design, area and population: This was an unmatched case-control study conducted with permission, at Kenyatta National Hospital (KNH), among women who had delivered at KNH, interviewed in labour ward and postnatal wards. Total sample size was 112, with 56 cases and 56 controls.

Materials and Methods: Following informed consent, enrollment of cases and controls who met the eligibility criteria was done by the principal researcher and research assistants. The cases comprised of women at Kenyatta National Hospital labour ward and postnatal rooms, who had been diagnosed with antepartum haemorrhage, interviewed after delivery, while the controls comprised of women admitted at the same time period as the cases, who had delivered vaginally or via caesarean delivery, without antepartum haemorrhage. Data was collected until the desired

sample size was met, using a questionnaire filled in with the aid of the interviewer. Data entry was done, and exported to SPSS version 21.0 software for analysis, with results being summarized in form of tables.

Results: The mean gestational age (weeks) was 38.9 for the cases and 38.3 for the controls ($p < 0.001$). Secondary school was the highest level of education attained by the majority, for both the cases (60.7%) and controls (60%). Patients presenting with low abdominal or back pain, were more likely to have antepartum haemorrhage, than those without, OR 38.3 95% CI 4.9-297.2 $p < 0.001$. The commonest causes of APH were found to be placenta praevia (41.1%) and abruptio placentae (35.7%). A history of abdominal trauma, heavy lifting or fall was reported in 14.3% of cases, while no such history was reported in the control group.

Conclusion: This study determined that the only known risk factor found to be significant, was a history of abdominal trauma, heavy lifting or fall, which is commonly associated with abruptio placentae. Abruptio and placenta praevia were found to be the most common causes of antepartum haemorrhage.

Recommendations: Early identification of risk factors of APH in pre-conception and antenatal periods, as well as patient education, should be considered as interventions, so as to possibly prevent, and effectively manage antepartum haemorrhage. Further studies on risk factors of antepartum haemorrhage, with larger sample sizes, in the future may be of benefit.

CHAPTER ONE

INTRODUCTION

Antepartum haemorrhage is vaginal bleeding in pregnancy occurring from 24 weeks and above and prior to delivery(1). It occurs in 3-5% of all pregnancies, and is an important cause of maternal and perinatal morbidity and mortality worldwide, as well as a cause of maternal “near miss”. Obstetric haemorrhage is one of the five major causes of maternal death in low resource countries(2) and it encompasses both antepartum and postpartum haemorrhage.

The major causes of antepartum haemorrhage are placenta praevia, abruptio placentae and uterine rupture. Others include: vasa praevia, cervical polyps, cervicitis, blood dyscrasias, cervical and vaginal neoplasms and antepartum haemorrhage of unknown origin(3).

Abruptio placentae is defined as premature placental separation from the site of implantation before delivery. It can be revealed, concealed or mixed: Revealed – where bleeding is visible externally, Concealed – where blood collects behind the separated placenta or between the membranes and decidua thus bleeding is not visible externally, and Mixed – features of both revealed and concealed.(4).

The primary cause of premature placental separation remains unknown but has been associated with the following risk factors: hypertensive disease in pregnancy, previous history of abruptio, preterm premature rupture of membranes, multiparity, substance abuse (e.g. cocaine, alcohol, and cigarettes), thrombophilias and abdominal trauma(1,5).

By definition placenta praevia is implantation of the placenta in the lower uterine segment, coming close to or completely covering the internal os. It is classified as complete, partial and

marginal: Complete placenta praevia - covers the entire os, Partial placenta praevia - partially covers the cervical os, and Marginal placenta praevia - lies next to the cervical os(5).

The pathophysiology of placenta praevia is poorly understood, but abnormal placentation is thought to be as a result of uterine scarring. Some risk factors include previous caesarian delivery, advanced maternal age, multiparity, multiple gestation and prior history of placenta praevia(3).

Uterine rupture is defined as the full thickness tearing of the uterine wall during pregnancy and delivery, and is a life threatening obstetric condition. It occurs mainly as a result of rupture of a previous caesarean scar, but may also occur spontaneously. Other associated risk factor include: congenital uterine malformations, uterine trauma, uterotonic drugs, history of myomectomy, fetal macrosomia and uterine instrumentation(6).

A systematic review and meta- analysis in the USA in 2012, found that no studies had reported the prevalence of antepartum haemorrhage, after searching various bibliographical databases.(7)

A study done at Kenyatta National Hospital in 1978, found that out of 4741 deliveries, 221 patients had antepartum haemorrhage (4.7%) (8) A descriptive retrospective study on maternal mortality in Central Province, Kenya, 2009-2010, found that the major cause of maternal mortality in Africa was haemorrhage (33.9%), and that according to the Health Management Information System, leading causes were antepartum and postpartum haemorrhage.(9)

Some maternal complications associated with antepartum haemorrhage include post-partum haemorrhage, shock, anaemia, sepsis, premature labour consumptive coagulopathy among others, while some fetal complications are prematurity, fetal death, fetal hypoxia, low birth weight and congenital malformations.

Antepartum haemorrhage with its associated morbidity and mortality on both mother and baby, has contributed however significantly, to the deterrence in achieving the millennium development goals 4 and 5 for 2015, concerning reduction in child mortality, and improvement of maternal health respectively. There are also gaps on risk factors associated with antepartum haemorrhage in our setting, which can be identified during the prenatal and antenatal periods, to prevent morbidity and mortality. This obstetric emergency needs to be addressed in order to better manage the patient, further emphasizing the importance of this study. There are few recent studies regarding risk factors of APH at Kenyatta National Hospital or in Kenya.

LITERATURE REVIEW

The World Health Organization and other professional societies defines antepartum haemorrhage as bleeding from the genital tract after 24 weeks gestation, though the American College of Obstetricians and Gynaecologists defines it as any bleeding from the genital tract after the 20th week of pregnancy and before the onset of labour.

Obstetric haemorrhage remains one of the major preventable contributors to maternal mortality globally(8). It is responsible for 25- 60% of maternal deaths(10). Antepartum haemorrhage is no longer a major cause of maternal mortality in high resource countries, but remains an important cause of perinatal and maternal morbidity(11). It is known to be an important cause of complication of pregnancy in low resource countries.

A report on Trends in Maternal Mortality: 1990-2013, established that globally, in the year 2010, maternal deaths were 289,000. Low resource countries accounted for 99% (286,000) of the global maternal deaths, with sub-Saharan region accounting for 62% (179,000) deaths. The adult lifetime risk of maternal mortality in sub-Saharan Africa was 1 in 38, compared to 1 in 3700, among women in high resource countries. (12)

Maternal haemorrhage, was ranked 59th, in the Global Burden of Disease (1990) in terms of DALY's, with the burden representing 0.3% of all conditions, and 11.9% of the burden of all maternal conditions(13). A systematic review by WHO, on global causes of maternal death between 2003-2009, showed that maternal death due to haemorrhage worldwide was 661,000, with high resource countries constituting 2400 deaths and low resource countries 659,000. A subgroup analysis showed that maternal death due to APH globally was 158,000 and 700 deaths, in high and low resource countries respectively, sub-Saharan Africa documenting 11,000 deaths.(14)

Several studies have been done showing the incidence and prevalence of antepartum haemorrhage in a specified population. The estimated incidence is 2- 5% of all pregnancies(1). A study done among Arab women in Qatar showed the prevalence to be 15.3%(15) and was concluded to be high when compared to other studies done 5-35 years ago. This was thought to be due to either under reporting or an increase in the incidence rate over the years.(16).A study done in Kenya on antepartum haemorrhage determined the incidence to be at 4.7% per total deliveries(8).There are no recent studies found showing if there has been an increase in the incidence and prevalence of antepartum haemorrhage among pregnant women.

The known causes of antepartum haemorrhage include: placental – placenta praevia and abruptio placentae, vasa praevia, uterine rupture, cervical – polyps, neoplasia and cervicitis, bloody show, vaginal – trauma and vaginitis, and antepartum haemorrhage of unknown origin(3). According to a report in 2003 on global burden of disease on maternal haemorrhage, about half of the cases of antepartum haemorrhage were due to placenta praevia or abruptio placenta, while in the rest of the cases the cause was indeterminate/ haemorrhage of uncertain origin(13).

Study done in India in 2014 on antepartum haemorrhage and its maternal and perinatal outcomes, showed that out of 100 cases 71% were due to placenta praevia, 27% as a result of abruptio placenta and 2% of unknown origin(10). A prospective study on third trimester antepartum haemorrhage done in North eastern Kenya in 2014, showed that the causes of 3rd trimester bleeding were as a result of placenta praevia (27.9%), placenta abruptio (26.2%), no documentation (16.4%) and 29.5% due to other causes including heavy show, cervicitis and uterine rupture(17).

A retrospective cohort study done in Ethiopia on predictors of perinatal mortality associated with placenta praevia and abruptio placenta, showed that perinatal mortality from both aetiologies was at 50%, concluding that it was probably one of the highest in the world. Placenta praevia associated perinatal mortality was found to be approximately 45%, 2 to 3-fold that of some low resource countries, and greater than 15-fold that of high resource countries(18). This when compared to a study done in 2011 in South Australia where perinatal mortality secondary to antepartum haemorrhage was at 9.3% (0.9 deaths/ 1000 births), where 16 deaths were due to placenta abruptio, 5 deaths from mothers with hemophilia, 1 death from placenta praevia and 1 death from vasa praevia, tells us that there is a lot that needs to be done especially in the developing world to ensure good maternal and fetal outcome(19).

Definition of severity of antepartum haemorrhage varies, but according to RCOG the definitions includes:

- 1) Spotting: staining, streaking or blood spotting on sanitary pad/ undergarment.
- 2) Minor haemorrhage: blood loss <50mls that has settled.
- 3) Major haemorrhage: blood loss of 50-1000mls with no clinical signs of shock.
- 4) Massive haemorrhage: blood loss >1000mls with or without clinically signs of shock.

A number of clinical and epidemiological studies have been done in order to identify the risk factors associated with antepartum haemorrhage. A meta-analysis of 13 observational studies (case-control and cohort) on cigarette smoking and hypertensive disease in pregnancy as risk factors for abruptio placenta, showed that smoking was associated with a 90% increase in the risk of abruption. It also determined an increased risk of abruption in the presence of smoking,

due to preeclampsia, chronic hypertension and chronic hypertension with superimposed preeclampsia(20).

A prospective cohort study done in the USA looking at 1st and 2nd pregnancy risk factors for abruptio placenta, showed that a history of abruptio in the 1st pregnancy increased the risk of abruptio in the 2nd pregnancy with an odds ratio of 3.2, and that duration of smoking and placental clots were an associated risk factor in the 2nd but not the 1st pregnancy(21). A cohort study done in Canada to determine the risk factors for abruptio placenta, showed that the significant risk factors included maternal age of 35 and above, cigarette smoking, delivery of male fetus, unmarried status, gestational and chronic hypertension, preeclampsia, prolonged rupture of membranes, chorioamnionitis and small for gestational age(22).

It has been speculated that there is an association between abruptio placenta and chorioamnionitis. A case control study done in India on the microbiological and histologic correlation between abruptio and chorioamnionitis, showed an increased incidence of histological chorioamnionitis (based on cervical swabs collected to identify specific microorganisms) in women with abruptio, when compared to those with no abruptio, without a significant difference(23). A case control study done in Uganda on risk factors of severe abruptio placenta found them to include low socio-economic status, co-existing hypertension, cesarean delivery in the previous pregnancy, a previous history of still birth, recurrent per vaginal bleeding, delivery of male neonates and a nonattendance of antenatal clinic prior to delivery(24).

In a meta-analysis of 58 observational studies, on etiology and risk factors for placenta praevia, risk factors found to be associated with placenta praevia included multiparity, previous caesarean delivery and abortion, cocaine and cigarette use in pregnancy and male fetuses.(25) A case

control study done in Uganda to determine risk factors for placenta praevia determined previous history of evacuation of uterus or dilatation and curettage, history of caesarean delivery and recurrent vaginal bleeding in the current pregnancy, as significant predictors of placenta praevia(26). This study also found that a history of evacuation and or dilatation and curettage was associated with four times the risk of placenta praevia and was found to be similar to other studies done in the USA and Nigeria(20,27).

Retrospective cohort study looking at caesarean delivery as a risk factor for placenta praevia, determined that there was an increased risk in the 2nd pregnancy, where there was a history of caesarean delivery in the 1st pregnancy, with an odd ratio of 1.6(28). The study result was found to be consistent with that of a retrospective cohort study done in the USA between 1995 and 2000, where the odds ratio was 1.5(29). A retrospective cohort study done in Malaysia to determine risk factors associated with placenta praevia in primigravida and non primigravida, found that there was a higher association of history of Assisted Reproductive Technologies (ART) and endometriosis, with placenta praevia in the primigravida(30). Studies done have showed a higher prevalence of placenta praevia in women following ART(31,32) when compared to spontaneous conception(32).

A case series report in the USA determined that the risk factors associated with uterine rupture included previous caesarean delivery, malpresentation, obstructed labour, uterine anomalies and induction of labour with prostaglandins(33). A retrospective cross sectional study in Nigeria on risk factors and perinatal outcomes of uterine rupture, found iatrogenic rupture to be higher than spontaneous rupture, with percentages of 72.1 and 27.9 respectively, with some of the causes including previous uterine scar, obstructed labour and oxytocin use(34).

A case series study done in Ireland reviewing the causes of uterine rupture found that previous caesarean delivery was the main associated risk factor. In the 21,998 primigravidas reviewed, there was no case of uterine rupture, while there were 2 cases in 39,529 multigravidas without a previous uterine scar, and 13 cases in 3961 multigravidas with history of caesarean delivery(35).

Prospective observational study done in the USA on women with a singleton gestation and a prior history of caesarean delivery, observed that symptomatic uterine rupture occurred in 0.7% of the women who underwent trial of labour(36).

The risk factors for vasa praevia have been documented and include low lying placenta, bilobed or succeturiate lobed placenta and velamentous cord among others(3). A retrospective review in the USA identifying cases of vasa praevia, showed that 55 out of the 60 cases were associated with abnormal placental location of abnormal cord insertion(37). A case control study in Japan analyzing placental and umbilical cord abnormalities as risk factors for vasa praevia, found an incidence of 7.2% of velamentous cord insertion in the cases compared to 0.9% from the controls, and an incidence of 6.5% of abnormal placental forms among the cases, and 2.1% among the controls. 3 cases of vasa praevia (2.2%) were observed in the cases but none were observed among the controls(38).

Antepartum haemorrhage of unknown origin (APHUO) is a diagnosis of exclusion. A prospective cohort study done in UK, Australia, Ireland and New Zealand looking at maternal cigarette smoking as a risk factor, found that there were higher rates of APHUO in smokers than in non-smokers, but it was found not to be an independent risk factor. This study also determined that the independent risk factors included vaginal bleeding in early pregnancy and obesity, and that there was a decreased risk of APHUO with the use of folic acid in the 1st trimester(39). A

cohort study done in Scotland on maternal and perinatal consequences of APH/ABPH, found that there was a significant association between social class, cigarette smoking, body mass index and APH/ABPH(40).

Patients with abruptio placenta may or may not present with vaginal bleeding. Other signs and symptoms include abdominal pain or uterine tenderness, back pains, rapid frequent contractions, reduced or absent fetal movements, features of shock, fetal distress and preterm labour(3). The characteristic clinical presentation of placenta praevia is painless per vaginal bleeding. A retrospective study done in Nigeria determined that the commonest clinical presentation of placenta praevia was vaginal bleeding (77.3%), followed by malpresentation and abnormal lie (9.1%)(41).

In resource poor settings, where certain diagnostic modalities may be unavailable, proper history taking and thorough physical examination is crucial in diagnosis of antepartum haemorrhage. According to RCOG, guidelines have been given pertaining to investigations done, to aid in the diagnosis of antepartum haemorrhage. They include: abdominal/ transvaginal ultrasound, Doppler ultrasound, cardiotocography, magnetic resonance imaging and Kleihauer test in rhesus negative women. Advances in obstetric care have enabled better anticipation, diagnosis and management of patients with antepartum haemorrhage though unexpected bleeding may occur despite optimal antenatal care(42).

Approach to management of patients with antepartum haemorrhage is expectant and interventional. Expectant management is indicated for women with APH depending on the aetiology, who is clinically stable with minimal or no vaginal bleeding. (1) The use of expectant management was first advocated by Macafee in 1945, in order to decrease the number of

premature births, and carry the pregnancy to a gestation with an increased survival rate. (43)

Examples include:

- Reclassification as a high risk patient upon diagnosis and thus increased number of antenatal visits. An epidemiological study done on unexplained antepartum haemorrhage concluded that women with antepartum haemorrhage should have increased fetal surveillance throughout the pregnancy(1).
- Hospitalization and bed rest.
- Use of steroids has been associated with significant reduction in perinatal mortality when given to mothers up to 34+6 weeks at risk of spontaneous or iatrogenic preterm labour(42).
- Tocolytics may be useful. A study done reviewing cases of antepartum haemorrhage showed that the use of tocolytics had no adverse maternal or fetal effects, but concluded that a prospective randomized trial was necessary to determine the benefits of tocolytic use(44).
- Supplementation- use of iron supplements to optimally correct anaemia.
- Analgesics and antiemetics where required.
- Anti-D immunoglobulin in rhesus negative women.

Intervention management includes: Blood transfusion, delivery- either vaginal or caesarean and resuscitative measures taken in patients who present with shock. Initial management of significant bleeding in women who are haemodynamically unstable presenting with antepartum haemorrhage is similar regardless of the aetiology. Baseline investigations and continuous fetal monitoring is recommended before definitive management(1).

One of the major complications of antepartum haemorrhage is hypovolaemic shock, especially so in the third trimester due to a physiological increase in the cardiac output which peaks at 30-34 weeks to 40-50%, and can therefore lead to massive haemorrhage. Studies done in South Africa on maternal deaths between 2005 and 2007, showed obstetric haemorrhage as the third most common cause of death at 12.4% of all deaths, and 108 deaths resulting from antepartum

haemorrhage. 74 of these deaths were concluded to be avoidable.(45) Other complications include: anaemia, fetal growth restriction, fetal death, prematurity, consumptive coagulopathy and postpartum haemorrhage(1). There is limited evidence to support interventions to prevent antepartum haemorrhage though a randomized controlled study demonstrated a reduction in the incidence of abruptio placentae with intrapartum management of preeclampsia using magnesium sulphate(46).

There are many associated maternal and perinatal morbidities and mortalities as a result of antepartum haemorrhage. A retrospective study done in India on women admitted with antepartum haemorrhage, showed a maternal mortality of 2.21%(47), similar when compared to another study done in India(48). Perinatal mortality was at 23.7%(45), lower when compared to other studies(49,50) with the authors concluding that it was probably due to better neonatal intensive care facilities. Perinatal morbidity was associated with low birth weight infants (83.18%), birth asphyxia (12.5%), and intrauterine growth restriction (12.39%), while maternal morbidity was associated with a high incidence of anaemia, caesarean delivery, blood transfusion, coagulopathies and puerperal pyrexia(50). A study in Nigeria on patterns of antepartum haemorrhage reported a rate of 11.1% maternal deaths and 19.2% fetal death(51), while a study done at Kenyatta National Hospital reported no maternal mortality cases and a 24.88% rate of perinatal mortality(16), double that reported in a study done in England in 1951, The dangerous placenta.(52)

JUSTIFICATION

Antepartum haemorrhage is an important cause of maternal and neonatal morbidity and mortality. There have been many cases reported but there is no recent available data on incidence and prevalence and on risk factors of antepartum haemorrhage locally, hence the need to identify the characteristics associated with this condition in our local environment. This study was conducted to provide information which can be used to develop Standard Operating Procedures (SOPs) in order to improve maternal and neonatal outcomes in women with antepartum haemorrhage, a small step in achieving the sustainable development goals (SDGs) associated with reducing maternal and neonatal mortality.

CONCEPTUAL FRAMEWORK

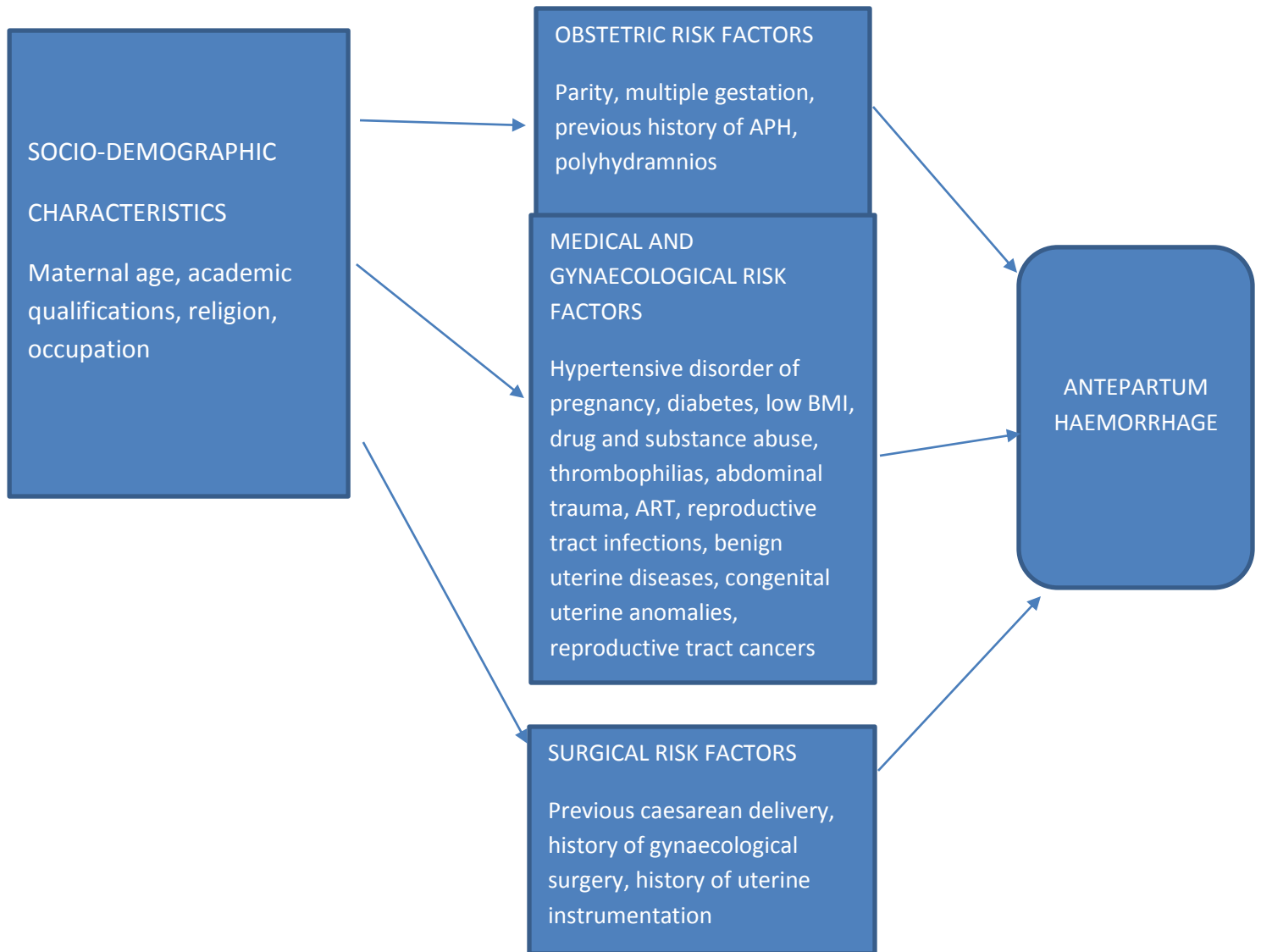


Figure 1: Conceptual Framework on risk factors of antepartum haemorrhage.

Antepartum haemorrhage is associated with adverse maternal and fetal outcomes. There are many known risk factors associated with APH including a previous history of APH, hypertensive disease, history of caesarean delivery among others. This study looked at the known risk factors, to determine the most common in our setup, in order to institute early preventive and interventional measures in order to improve maternal and perinatal outcomes. Figure 1 shows the

socio-demographic characteristics that were looked at among the study participants, and the relationship between risk factors and antepartum haemorrhage.

CHAPTER TWO

METHODOLOGY

RESEARCH QUESTION

What are the risk factors of antepartum haemorrhage among women who receive intrapartum and/or postpartum care at Kenyatta National Hospital?

NULL HYPOTHESIS

There is no association between risk factors and the development of antepartum haemorrhage.

BROAD OBJECTIVE

To determine the risk factors of antepartum haemorrhage among women who receive intrapartum and/or postpartum care at Kenyatta National Hospital.

SPECIFIC OBJECTIVES

- 1) To determine the sociodemographic characteristics of women with antepartum haemorrhage at Kenyatta National Hospital.
- 2) To determine the risk factors of women with antepartum haemorrhage at Kenyatta National Hospital.

Study Design

The study was an un-matched case control study in a hospital set-up, with 56 cases and 56 controls, ratio 1:1.

Study Area

The study was conducted at Kenyatta National Hospital, which is situated in Nairobi County. Kenyatta National Hospital is the oldest hospital in Kenya, founded in 1901. It serves as a national referral and teaching hospital. It has an average bed capacity of 1800. The study was carried out in the hospital's labour ward and postnatal rooms.

Study Population

The study participants were drawn from women who were receiving intrapartum and/or postpartum care at Kenyatta National Hospital. Cases included women admitted to KNH who had been diagnosed with antepartum haemorrhage in the current pregnancy, interviewed after delivery, while the controls included women admitted at the same time period as the cases, who had delivered vaginally or via caesarean, without antepartum haemorrhage.

Study Variables

The socio-demographic variables included: age, religion and academic qualifications. The obstetric factors included gestational age and parity. Medical history included: previous history of antepartum haemorrhage, a history of hypertensive disease in pregnancy, history of trauma, history of substance abuse and history of multiple gestation. Surgical history comprised of: previous history of caesarean delivery, history of myomectomy and history of uterine instrumentation.

ELIGIBILITY CRITERIA

Inclusion Criteria

- Women who were recruited, had been admitted at Kenyatta national Hospital labour ward and postnatal rooms, having been diagnosed with antepartum haemorrhage, interviewed after delivery.
- Women admitted at the same time as the cases at Kenyatta National Hospital, who had delivered via vaginal route or caesarean section, without antepartum haemorrhage in the current pregnancy.
- Women who gave informed consent to participating in the study.

Exclusion Criteria

- Women who presented with antepartum haemorrhage but did not deliver in the hospital.

Study Duration

The study was conducted between September 2015 and November 2016.

Sample size determination.

This study compared risk factors between the case and the control groups, and for the purpose of estimation, previous caesarean section rates were used as a risk factor for antepartum haemorrhage. Sample size was calculated using a formula for comparing 2 proportions as follows:

$$n = \frac{2(Z_{1-\alpha/2} + Z_{1-\beta})^2 P_{av}(1-P_{av})}{(P_0 - P_1)^2}$$

N is the sample size required in each group

$Z_{1-\alpha/2}$ refers to the level of significance or confidence interval = 1.96 for 95% CI

$Z_{1-\beta}$ refers to the power of obtaining difference between the two groups = 0.84 for 80% power

P_0 – Proportion of women with previous caesarean section in the control group = 12.3% (MOH, 2015)

Intervention group

According to Ananth et al 1997, the odds of developing placenta praevia in women with previous caesarean delivery was 3.8. Using mathematical calculations, proportion of women with previous caesarean section in the intervention group (P_1) = 34.8%

P_{av} – Average proportion of previous CS in the two groups = 23.6%

Substituting into the formula:

Sample size (n) was **56** in each group. A minimum of **112** patients was required to compare the outcome of intervention.

Sampling Procedure/Sampling Technique

The research team comprised of the principle investigator and two research assistants consisting a registered clinical officer and nurse, working at Kenyatta National Hospital. The principle investigator provided the research assistants with reading material necessary to understand antepartum haemorrhage, and trained daily for a week, on proper study procedures. Pre-questionnaire testing was done by the research assistants, supervised by the principal researcher, in order to assess for proper and standard data collection procedures. Supervised data collection during the first week was done. Women who had delivered and were clinically stable were approached by the study team for participation, and were provided with all the necessary information as pertains to the study in English or Kiswahili, and given an opportunity to make comments or ask questions. Those willing to participate were assessed for eligibility.

A consecutive numbered list of women delivering at Kenyatta National Hospital was developed for each day throughout the data collection period, whereby cases and controls were noted. Consecutive enrollment of cases as they came was done, and once the principle researcher or research assistants sampled a case, the next patient without antepartum haemorrhage, who met the eligibility criteria, was enrolled as the control.

Data Collection Instrument

The data collection instrument was a mixed, both open-ended and closed-ended questionnaire, administered by the research team, designed to capture all the information needed from the study participants, as pertains to the study.

Data Collection Procedure

The Principal researcher and research assistants, checked the records in labour ward daily in order to identify patients diagnosed with antepartum haemorrhage. All those with a confirmed diagnosis of APH, who were willing to participate in the study, were recruited as the cases, while those who were admitted at the same time period as the cases, without antepartum haemorrhage, were recruited as the controls. The study participants were informed about the study, given a chance to ask any questions or clarifications as pertaining to the study, after which informed consent was sought. The questionnaires were then filled in by the participants in the presence of the research team, in case any help was needed. This was done until the desired sample size was achieved.

Data quality Assurance

Quality assurance was enhanced continuously throughout the study period to maximize on the validity and reliability of the findings. The accuracy of tabulation was checked by having a sample of the tables re-done. Pre-testing of the study instrument was carried out in a non-study hospital to correct it for bias, misinterpretation of the questions and ambiguity. The validity of the study was ascertained by ensuring that the data collection instruments reflected the objectives of the study. The research instrument was validated by the university supervisors.

During data collection process trained research assistant were deployed under the guidance of the principle researcher to ensure questionnaires were completed and relevant information was

collected. EpiData software was used during data entry so as to get rid of inconsistencies and to ease data cleaning process.

Reliability of data is a measure of the degree to which the research data would yield the same results after repeated trials. The reliability of the questionnaire was established through split half technique whereby the data collected was randomly split into two datasets and Cronbach's alpha coefficient used to test reliability of data collected. An alpha (α) score of 0.70 or higher was considered satisfactory in ascertaining reliability.

Data analysis

Data was entered and managed in Microsoft Access 2013 Database. Data was cleaned at the end of data entry and then exported to SPSS version 21.0 software for analysis. The study population was described by summarizing the demographic characteristics into means or medians and percentages, for continuous and categorical variables respectively. The demographic characteristics and risk factors were compared between antepartum haemorrhage group and the control group. Student's T test was used to compare means, Mann Whitney's U test to compare medians, and Chi square tested association of categorical data between cases and controls. Odds ratios were reported for the categorical data, to determine the risk of antepartum haemorrhage associated with specific exposures. A multiple logistics regression model was used to establish the independent factors associated with antepartum haemorrhage. All statistical tests were done at 5% level of significance (p value less than or equal to 0.05). Findings were presented in the form of text and tables.

STUDY STRENGTHS

1. The study design- case control, was ideal for studying the multiple risk factors associated with antepartum haemorrhage.
2. Kenyatta National Hospital being a referral center, serves a large population, therefore achieving the desired sample size was not difficult.

STUDY LIMITATIONS

1. Identification of cases was obtained from the record book in the triage area of labour ward, misdiagnosis may have led to lack of identification of the cases or controls.
2. Some of the questions on the questionnaire required the participant to recall past events, there may have been recall bias.
3. The study was conducted at a referral facility, the results may not have been representative of the general population.

ETHICAL CONSIDERATIONS

Permission to conduct the research was sought and granted from the KNH/UON Ethics and Research Committee. Informed consent was obtained from the study participants prior to recruitment. Participation in the study was voluntary and no study participant was coerced into doing so. Participants had a right to withdraw from the study at any time without denial of services. The study was carried out while respecting the dignity of the study participants. Codes were used to refer to participants to ensure their privacy and anonymity. The research data was kept under lock and key to ensure confidentiality and used only for research purposes. The study caused no physical, mental or emotional harm to the participants. No information in the study was fabricated or misrepresented to the best of the knowledge of the research team. Precautions were taken to avoid or minimize bias during the study period by: clearly defining the study

population, using a standard measurement instrument i.e. questionnaire to collect data, framing of questions in such a way as to minimize recall bias, pre-questionnaire testing to improve and refine it, use of standardized interviewers' techniques through training and use of few interviewers' to minimize variation.

CHAPTER THREE: RESULTS

This was an unmatched study comprising 112 women, 56 with antepartum haemorrhage and 56 without.

Table 1: Socio-demographic characteristics

	Case n (%)	Control n (%)	OR (95% CI)	p value
Mean age (SD)	29.0 (5.7)	28.1 (4.8)	-	0.380
Religion				
Protestant	46 (82.1)	51 (91.1)	1.0	
Catholic	6 (10.7)	4 (7.1)	1.7 (0.4-6.3)	0.452
Muslim	3 (5.4)	1 (1.8)	3.3 (0.3-33.1)	0.305
Hindu	1 (1.8)	0	-	1.000
Level of Education				
Primary	6 (10.7)	9 (16.4)	0.5 (0.2-1.9)	0.343
Secondary	34 (60.7)	33 (60.0)	0.8 (0.4-2.0)	0.690
Tertiary	16 (28.6)	13 (23.6)	1.0	
Mean gestation in weeks (SD)	38.9 (3.3)	38.3 (2.6)		< 0.001
Occupation				
Unemployed	27 (49.1)	37 (66.1)	0.7 (0.3-2.1)	0.556
Self-employed	19 (34.5)	10 (17.9)	1.9 (0.6-6.3)	0.294
Formally employed	9 (16.4)	9 (16.1)	1.0	

In table 1 above, the mean age among the cases was 29.0 years, which was not significantly different from 28.1 years among the controls. (p value = 0.380) The mean gestation in weeks

among the cases was 38.9, and 38.3 among the controls. Secondary school was the highest level of education attained for both the cases and controls. Majority of the study participants in both the case and control groups was unemployed.

Table 2: Obstetric factors

	Case n (%)	Control n (%)	OR (95% CI)	p value
Mean gestation at 1 st ANC visit (SD)	18.0 (5.0)	19.4 (4.1)	-	0.112
ANC visits attended				
1	0	1 (1.8)	-	1.000
2	5 (9.3)	2 (3.6)	2.9 (0.5-15.8)	0.215
3	7 (13.0)	4 (7.1)	2.0 (0.6-7.5)	0.280
>3	42 (77.8)	49 (87.5)	1.0	-
Complications during delivery				
Yes	45 (80.4)	29 (53.7)	3.5 (1.5-8.2)	0.004
No	11 (19.4)	25 (46.3)	1.0	
Low abdominal / back pains				
Yes	23 (41.1)	1 (1.8)	38.3 (4.9-297.2)	< 0.001
No	33 (58.9)	55 (98.2)	1.0	
Absent/ reduced fetal movements				
Yes	13 (23.2)	0	-	0.998
No	43 (76.8)	56 (100.0)		

As shown in table 2, complications during delivery and low abdominal/ back pain were significantly associated with antepartum haemorrhage. Patients with antepartum haemorrhage were more likely to complain of low abdominal/ back pain (OR 38.3 95% CI 4.9-297.2 $p < 0.001$) There was a significantly higher risk of complications associated with antepartum haemorrhage during delivery among the cases when compared to the controls. (OR 3.5 95% CI 1.5-8.3 $p = 0.004$) There was no significant association between number of antenatal visits, mean gestation at first antenatal visit and absent/ reduced fetal movements with antepartum haemorrhage in this study.

Table 3: Aetiology and severity of APH

Variable	Frequency (%)
Sought medical attention for vaginal bleeding	
Yes	55 (98.2)
No	1 (1.8)
Established cause of vaginal bleeding	
Bloody show	5 (8.9)
Placenta abruptio	20 (35.7)
Placenta praevia	23 (41.1)
Vasa praevia	1 (1.8)
Ruptured uterus	1 (1.8)
Coagulopathies	1 (1.8)
Others	1 (1.8)
Severity of haemorrhage	
Spotting	1 (1.8)
Mild	32 (58.2)
Moderate	21 (38.2)
Severe	1 (1.8)

Table 3: The most common causes of antepartum haemorrhage in this study were found to be placenta praevia (41.1%) and abruptio placenta (35.7%) with severity of bleeding being mainly mild and moderate, 58.2% and 38.2% respectively.

Table 4: Risk factors of antepartum haemorrhage

Variable	Case n (%)	Control n (%)	OR (95% CI)	p value
Mean parity (SD)	2.4 (0.9)	2.3 (1.0)	-	0.775
History of APH in previous pregnancies				
Yes	0	2 (3.6)	-	0.495
No	56 (100.0)	54 (96.4)		
History of vaginal bleeding/ spotting early in the pregnancy				
Yes	9 (16.4)	6 (10.7)	1.6 (0.5-4.9)	0.384
No	46 (83.6)	50 (89.3)	1.0	
Previous caesarean delivery				
Yes	19 (33.9)	13 (23.2)	1.7 (0.7-3.9)	0.209
No	37 (66.1)	43 (75.8)	1.0	
Number of caesarean deliveries				
1	15 (78.9)	10 (76.9)	1.0	
2	3 (15.8)	1 (7.7)	2.0 (0.2-22.1)	0.571
3	1 (5.3)	1 (7.7)	0.7 (0-11.9)	0.783
>3	0	1 (7.7)	-	1.000
History of premature rupture of membranes in current pregnancy				
Yes	4 (7.1)	9 (16.1)	0.4 (0.1-1.4)	0.140

No	52 (92.9)	47 (83.9)	1.0	
History of multiple pregnancy				
Yes	3 (5.4)	2 (3.6)	1.5 (0.3-9.5)	1.000
No	53 (94.6)	54 (96.4)	1.0	
History of smoking in past				
Yes	0	3 (5.4)	-	0.243
No	56 (100)	53 (94.6)		
Alcohol during current pregnancy				
Yes	1 (1.8)	1 (1.8)	1.0 (0.1-16.4)	1.000
No	55 (98.2)	55 (98.2)	1.0	
Alcohol use in the past				
Yes	34 (60.7)	27 (48.2)	1.7 (0.8-3.5)	0.184
No	22 (39.3)	29 (51.8)	1.0	
Presence of other medical illness				
Yes	18 (32.1)	19 (33.9)	0.9 (0.4-2.0)	0.841
No	38 (67.9)	37 (66.1)	1.0	
Medical disease				
Hypertension	3 (16.7)	1 (5.3)	3.1 (0.3-30.9)	0.309
Diabetes	0	2 (10.5)	-	0.154
Pre-eclampsia	4 (22.2)	5 (26.3)	0.8 (0.2-3.1)	0.728
Asthma	2 (11.1)	6 (31.6)	0.3 (0.1-1.76)	0.141
Retroviral disease	5 (27.8)	4 (21.1)	1.3 (0.3-5.0)	0.728
Epilepsy	1 (5.6)	0	-	0.315
Eclampsia	1 (5.6)	0	-	0.315
Others	5 (27.8)	4 (21.1)	1.3 (0.3-5.0)	0.728

History of Pap smear				
Yes	15 (27.3)	12(21.4)	1.4 (0.6-3.3)	0.473
No	40 (72.7)	44 (78.6)	1.0	
Past gynaecological surgery				
Yes	1 (1.8)	2 (3.6)	0.5 (0-5.6)	1.000
No	55 (98.2)	54 (96.4)	1.0	
Past uterine instrumentation				
Yes	9 (16.1)	9 (16.1)	1.0 (0.4-2.7)	1.000
No	47 (83.9)	47 (83.9)	1.0	
History of abdominal trauma, heavy lifting or fall				
Yes	8 (14.3)	0	-	0.006
No	48 (85.7)	56 (100.0)		

As shown in table 4, a history of abdominal trauma, heavy lifting or fall in the current pregnancy, was reported in 14.3% of the cases, while no participant from the control group reported a similar history. (p=0.006) The other risk factors known to be associated with APH, that included a previous history of antepartum haemorrhage, history of caesarean delivery and uterine instrumentation among others, were found not to be significantly associated with antepartum haemorrhage in this study. (p>0.05) This is an important finding as it shows that the known risk factors may not always be the cause of APH.

Table 5: Logistic regression

Variable	Adjusted OR (95% CI)	p value
Low abdominal/ back pain		
Yes	38.9 (4.7-320.2)	0.001
No	1.0	
History of abdominal trauma, fall or heavy lifting		
Yes	7.3 (0.7-72.6)	0.089
No	1.0	

Gestational age, complications during delivery, presence of low abdominal or back pain and history of abdominal trauma, fall or heavy lifting were included in the multiple logistic model. As shown in table 5, antepartum haemorrhage was independently associated with low abdominal or back pain, OR 38.9 95% CI 4.7-320.2 p=0.001. History of abdominal trauma, fall or heavy lifting was not independently associated with antepartum haemorrhage in this study.

Table 6: Sub-analysis on low abdominal/ back pain and risk factors of antepartum haemorrhage

Variable	Low abdominal/ back pain		p value
	Yes (n=24)	No (n=88)	
	n (%)	n (%)	
Mean parity (SD)	2.5 (1.0)	2.3 (1.0)	0.539
History of APH in previous pregnancies			
Yes	0	2 (2.3)	1.000
No	24 (100)	86 (97.7)	
History of vaginal bleeding/ spotting early on in pregnancy			
Yes	4 (16.7)	11 (12.6)	0.736
No	20 (83.3)	76 (87.4)	
Have undergone CD previously			
Yes	8 (33)	24 (27.3)	0.560
No	16 (66.7)	64 (72.7)	
Number of caesarean deliveries			
1	7 (87.5)	18 (75.0)	1.000
2	1 (12.5)	3 (12.5)	
3	0	2 (8.3)	
>3	0	1 (4.2)	
>3	0	1 (4.2)	
History of PROM in current pregnancy			
Yes	1 (4.2)	12 (13.6)	0.292
No	23 (95.8)	76 (86.4)	
History of multiple pregnancy			
Yes	2 (8.3)	3 (3.4)	0.291
No	22 (91.7)	85 (96.6)	
History of smoking			
Yes	0	3 (3.4)	1.000
No	24 (100.0)	85 (96.6)	
Alcohol use in current pregnancy			
Yes	0	2 (2.3)	1.000
No	24 (100.0)	86 (97.7)	

History of alcohol use in the past			
Yes	15 (62.5)	46 (52.3)	0.373
No	9 (37.5)	42 (47.7)	
Presence of medical disease			
Yes	9 (37.5)	28 (31.8)	0.600
No	15 (62.5)	60 (68.2)	
History of gynaecological surgery			
Yes	0	3 (3.4)	1.000
No	24 (100.0)	85 (96.6)	
History of uterine instrumentation			
Yes	6 (25.0)	12 (13.6)	0.212
No	18 (75.0)	76 (86.4)	
History of abdominal trauma, fall or heavy lifting			
Yes	4 (16.7)	5 (5.7)	0.097
No	20 (83.3)	83 (94.3)	

Table 6: A sub-analysis was done to determine risk factors of APH in women who presented with low abdominal or back pain. None of the known risk factors associated with antepartum haemorrhage were found to be significantly associated with low abdominal/ back pain.

DISCUSSION

Antepartum haemorrhage is a multi-factorial disease complicating 3-5% of pregnancies globally.

This un-matched case control study was carried out on 112 women presenting at Kenyatta National hospital for delivery, in order to determine the risk factors associated with antepartum haemorrhage among women receiving intrapartum and/ or postpartum care. In this study, the significant socio-demographic characteristic was mean gestational, with the cases at 38.9, and 38.3 for the controls.

Majority of the women with antepartum haemorrhage in this study, presented at a mean gestational age of 38 weeks. A study in 2014 in India, on antepartum haemorrhage and its maternal and perinatal outcome, found that majority of the cases, were at a gestational age of 37 weeks and above at the time of admission, similar to the findings in this study, where the mean gestational age among the cases was 38.9.(10)

This study also found that those participants who presented with symptoms of low abdominal or back pain were more likely to have antepartum haemorrhage than those who did not. (OR 38.3 95% CI 4.9-297.2 $p < 0.001$). Low abdominal or back pain does not in all causes of antepartum haemorrhage and is more commonly associated with abruptio placentae. Participants who presented with low abdominal or back pain with antepartum haemorrhage were distinguished from those with low abdominal or back pain specific to labour. There are few studies that have been done looking at abdominal pain and antepartum haemorrhage generally. A study in the USA in 2004, looking at women who presented with abdominal pain during the antenatal period, found them to have spontaneous uterine rupture.(57) Majority of the patients in this study with low abdominal pain as a symptom were found to have abruptio placentae.

A further sub-analysis on those presenting with low abdominal or back pain was done to determine association with risk factors of APH. There was no association found. Although number of antenatal visit was not statistically significant in this study, antenatal care and specifically focused antenatal care, has been shown to promote healthy behavior, identify and treat health problems and improve maternal and perinatal health outcomes.(2) World Health Organization recently recommended at least eight antenatal visits, which has been shown to reduce perinatal mortality by up to 8 per 1000 live births, when compared to the minimum four visits.(56) Majority of the participants, for both cases and controls, reported more than three antenatal visits (77.8% and 87.5 % respectively), but less than eight visits. This was not significantly associated with antepartum haemorrhage.

The commonest causes of APH among the participants were found to be placenta praevia (41.1%), and abruption placenta (35.7%). There was only one reported case of vasa praevia, ruptured uterus and coagulopathy, suggesting that the two most common causes of APH in our set-up were placenta praevia and abruption. A study at Garissa Provincial General Hospital Kenya, in 2010 on third trimester APH, found that the most commonly documented causes were placenta praevia (27.9%) and abruption placenta (26.2%), similar to this study findings. (17) Most patient presented with either minor or major haemorrhage, with only one participant who was a referral from a peripheral facility, presenting with massive haemorrhage, due to delay in seeking medical attention and delay in referral.

The main objective of this study was to determine the commonest risk factors associated with antepartum haemorrhage in our set up, in order for early identification and intervention, to promote better maternal and perinatal outcomes. We found that those presenting with a history of abdominal trauma, heavy lifting or fall, were more likely to have antepartum haemorrhage, than

those who did not. ($p=0.006$) A number of clinical studies have identified heavy lifting, trauma or fall as risk factors for antepartum haemorrhage. A study in the USA in 2004 on blunt trauma in pregnancy, found that blunt trauma secondary to road traffic accidents, domestic violence and falls, resulted in uterine rupture and abruptio placentae among other complications. (53)

Several studies conducted, have showed that certain proportion of abruptio placentae are related to mechanical events such as blunt abdominal trauma,(54), or rapid uterine decompression resulting in shearing forces, as in road traffic accidents.(55,56). A study in Taiwan, China, showed that severe trauma was associated with a six-fold increase in the risk of abruptio. (57) Heavy lifting was the commonest precipitating factor for APH. This is probably because majority from the catchment population are either housewives or employed in the informal sector, where duties that require heavy lifting are carried out.

In this study the reported risks of APH have not been demonstrate as done in some studies. A study in India in 2016, found that the commonest risk factor associated with APH was pre-eclampsia/ eclampsia (36%), followed by a history of caesarean section. (26%) (58) Though maternal smoking has consistently been determined as a risk factor for abruptio placentae in a number of populations (20, 59), our study shows no association between maternal smoking and antepartum haemorrhage, probably due to the low frequency of smoking among the catchment population.

This study did not demonstrate any association between these risk factors with antepartum haemorrhage.

CONCLUSION

1. This study identified placenta praevia and abruptio placentae to be the most common causes of antepartum haemorrhage in our set-up,
2. Mainly heavy lifting, trauma or fall being significantly associated with APH. Other common risk factors for development of APH were not demonstrated to have statistical significance in relation to APH.
3. Patient education on what antepartum haemorrhage is and seeking prompt and appropriate health care, early identification by health care professionals of risk factors associated with especially placenta praevia and abruptio, during pre-conception and antenatal periods, should be considered as interventions to possibly prevent and effectively manage antepartum haemorrhage.

RECOMMENDATIONS

1. Drills on management of antepartum haemorrhage, especially major and massive haemorrhage, which studies have shown to increase knowledge in obstetric emergency management among health care professionals, should be carried out periodically at all health facility levels.
2. Formulation and implementation of policies that ensure access to comprehensive obstetric care for all women are necessary, in order to prevent morbidity and mortality associated with antepartum haemorrhage.

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APPENDIX 1: CONSENT FORM

PART 1: INFORMATION SHEET

Introduction

Dr. Pinckie Njoroge is a post-graduate student in the department of Obstetrics and Gynaecology, University of Nairobi. I am currently carrying out a study: Risk factors of antepartum haemorrhage at Kenyatta National Hospital. You are invited to participate in this study and can take all the time necessary to decide whether to participate or not. Please take time to read through the information provided below. If there are any questions, comments or clarifications, please feel free to ask the principle investigator or research assistants.

Purpose of study

This study aims to collect information on the most common risk factors that are associated with antepartum haemorrhage in our setup, in order to better manage patients, reducing the complications associated with this disease, improve the outcomes for both mother and baby.

Procedure

If you decide to participate in this study, you will sign and date the consent form. A copy of the completed form will be made and given to you. You will complete a questionnaire that will be provided to you. A member of the research team will be present for any questions or clarifications you may have.

Potential risks

There are no anticipated risks associated with this study.

Potential benefits

The information collected by the research team is aimed to better manage patients with antepartum haemorrhage. You will also be able to better understand your condition, so as to be better prepared in future pregnancies.

Confidentiality

The information collected in this study will be confidential. No names will be used and instead, each participant will be assigned an identification number. Only the research team will have access to the information, which will be kept under lock and key. Upon completion of the study, results will be shared only to the relevant parties.

Right to refuse/ withdraw

Participation in this study is voluntary, therefore, you do not have to take part if you do not desire to. You may decide to withdraw from the study at any time you wish. Declining from participating or withdrawing will not in any way influence your current or future treatments/ interventions and all your rights will be respected.

Whom to contact

For any questions or clarifications about the study, feel free to contact:

1. Dr. Pinckie Njoroge (Principle investigator)

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2. Prof. Omondi Ogutu (Lead supervisor)

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Email: oomogutu@gmail.com

3. Secretary KNH/UON ERC

P.O Box 19676-00202, Nairobi.

Tel: (254-020) 2726300-9

Email: uonknh_erc@uonbi.ac.ke

PART 11: CONSENT

I have read and understood the information provided above. I have been fully explained to about the study, and I have had an opportunity to ask questions, which have been answered to my satisfaction. I have agreed to participate in this study voluntarily, and have not been coerced, manipulated or bribed in any way.

Participant's name:

Participant's signature: Or Thumb print.....

Date:

Witness signature:

Date:

Statement by researcher

I have explained to the participant about the study. I have given the participant an opportunity to ask questions relevant to the study, and have answered them to the best of my abilities. I have confirmed that the participant has given consent voluntarily.

Name of researcher:

Signature:

Date:

APPENDIX 1B: RIDHAA YA MAFUNZO SEHEMU YA KWANZA: MAELEZO

Utangulizi

Daktari Pinckie Njoroge ni mwanafunzi wa Chuo Kikuu cha Nairobi, akiangazia maswala ya uzazi na afya ya wanawake kwa jumla. Ninafanya uchunguzi wa: Chanzo cha kuvuja damu ukiwa mja mzito, katika hospitali ya rufaa ya Kenyatta. Unakaribishwa kushiriki katika uchunguzi huu, na uamuzi wa kushiriki ni hiari yako. Kama kuna maswali yoyote au ufafanuzi utakao hitajika, kuwa huru kuwasiliana na mdadisi mkuu.

Lengo la utafiti

Uchunguzi huu una nia ya kutambua chanzo kinachohusika na uvujaji wa damu, kwa nia ya kuboresha matibabu, kupunguza madhara yanayotokana na ugonjwa huu, ili kuimarisha afya ya mama na mtoto.

Namna

Ukiamua kushiriki katika uchunguzi huu, utatia sahihi na tarehe katika fomu ya makubaliano. Utahitajika kujibu maswali utakayopatiwa, na kutakuwa na msaidizi atakapo hitajika.

Hasara inayotarajiwa

Hakuna hasara inayotarajiwakatika uchunguzi huu.

Faida inayotarajiwa

Matokeo ya uchunguzi huu yana lengo la kutoa matibabu bora kwa waadhiriwa wa ugonjwa huu wa kuvuja damu, na kuboresha afya kwa vizazi vijaavyo.

Usiri

Matokeo ya uchunguzi huu yatawekwa siri. Hakuna majina hayatatumika, kila muhusika atapewa nambari. Matokeo ya uchunguzi yatakabidhiwa kwa wanaohusika.

Haki ya kukataa

Kushiriki katika uchunguzi huu ni kwa kujitolea. Una haki ya kujitoa kwa uchunguzi wakati wowote bila ya madhara yoyote.

Kuwasiliana

Kwa maswali yoyote au ufafanuzi wasiliana na:

Daktari Pinckie Njoroge (Mtafiti mkuu)

Sanduku la posta: 73897-00200, Nairobi

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SEHEMU YA PILI: MAKUBALIANO

Nimesoma na nikaelewa ujumbe ulioko hapa juu. Nimeelezwa kwa makini kuhusu uchunguzi huu na nilipata nafasi ya kuuliza maswali yaliyojibiwa kamili. Nimekubali kushiriki katika uchunguzi huu bila kulazimishwa ama kupewa hongo.

Jina la muhusika:

Saini ya muhusika: Au Alama ya kidole:

Tarehe:

Saini ya shahidi: Tarehe:

Taarifa ya mdadisi

Nimewaelezea wahusika kuhusu utafiti na nakawapatia nafasi ya kuuliza maswali. Nimeyajibu maswali yote niwezavyo. Nimehakikisha kuwa wanaohusika kuwa wamekubali kwa hiari yao.

Jina la mdadisi:

Saini:

Tarehe:

APPENDIX 2: QUESTIONNAIRE
SECTION A: Demographic Characteristics

1. Age in complete years.....
2. Religion: Protestant [] Catholic [] Muslim [] Hindu []

Other (Specify).....

3. What is your highest academic qualification?
 - a. None []
 - b. primary []
 - c. Secondary []
 - d. Tertiary. []
 - e. Other [] Specify.....

4. Weeks / months of Pregnancy.....

5. Occupation.....

SECTION B: Occurrence of Antepartum haemorrhage

1. At what gestation did you start your antenatal clinic visits?
2. How many antenatal clinic visits did you attend? (circle the appropriate answer)

- a. One
 - b. Two
 - c. Three
 - d. More than three (specify)
3. Is there a history of ultrasound done for the current pregnancy?
- a. Yes
 - b. No
4. In this delivery have you had any complications?
- a. Yes
 - b. No
5. If yes in Q. 4 which complication (s) have you encountered.....
6. After 24 weeks of your current pregnancy did encounter any of the following symptoms of antepartum haemorrhage? (tick as many as possible)
- a. Vaginal bleeding.
 - b. Low abdominal or back pain.
 - c. Absent or reduced fetal movements.

d. Others (Specify).....

7. If per vaginal bleeding was present did you seek medical attention?

a. Yes

b. No

8. If vaginal bleeding was present, what was the cause?

a. Bloody show

b. Placental abruption

c. Placenta praevia

d. Vasa praevia

e. Ruptured Uterus

f. Cervical causes: cervicitis, cervical lesions.

g. Vaginal causes: vaginitis, vaginal lesions.

h. Coagulopathies

i. Other (specify).....

9. How severe is the haemorrhage?

- a. Spotting
- b. Minor haemorrhage
- c. Major haemorrhage
- d. Massive haemorrhage

NB: Spotting- straining or streaking on sanitary pad/ cotton wool/ undergarment.

Minor- soiled pad/ cotton wool/ undergarment = <50mls

Major- soaked sanitary pad =100mls; soaked large cotton 45*45cm = 350mls; soaked small cotton 10*10 = 60mls

Massive bed spill=1000mls; floor spill of 100cm diameter =1500mls; bed + floor spill= 2000mls.

SECTION C: Risk factors associated with Antepartum Haemorrhage

10. What is your parity?

11. Is there a history of antepartum haemorrhage diagnosed in previous pregnancies

- a. Yes
- b. No

12. Is there a history of per vaginal bleeding/ spotting early on in the pregnancy?

- a. Yes (If yes specify weeks/ months).....

b. No

13. Have you undergone caesarean delivery in your previous delivery (s)?

a. Yes

b. No

14. If yes to Q. 13 how many caesarean deliveries have you undergone?

a. One

b. Two

c. Three

d. More than three (specify).....

15. Have you had a history of premature rupture of membranes in the current pregnancy?

a. Yes

b. No

16. Was this last pregnancy a multiple pregnancy?

a. Yes

b. No

17. Do you currently smoke tobacco/ cigarettes?

a. Yes

b. No

18. If no to Q. 17 did you ever smoke in the past?

a. Yes

b. No

19. Do you currently take alcohol?

a. Yes

b. No

20. If no to Q. 19 did you ever take alcohol in the past?

a. Yes

b. No

21. Do you have any other medical disease you have been diagnosed with in the past?

a. Yes

b. No

22. What was the diagnosed disease?

a. Hypertension

b. Diabetes

c. Pre- eclampsia

d. Coagulopathies

e. Others (specify)

23. Have you had a history of Pap smear/ via/villi done?

a. Yes

b. No

24. Have you had a gynecological surgery performed in the past?

a. Yes (specify).....

b. No

25. Have you had uterine instrumentation done in the past? (D&C, MVA, Hysteroscopy etc

a. Yes

b. No

26. Was the current pregnancy via in vitro fertilization?

a. Yes

b. No

27. Have you had a history abdominal trauma, fall or heavy lifting during the current pregnancy?

a. Yes (specify)

b. No

CHECKLIST

1. Date
2. Number of deliveries made
3. Number of diagnosed cases of antepartum haemorrhage.
4. Number of controls.