

## The composite immediate adverse maternal outcomes among women in labor referred to Kampala International University Teaching Hospital.

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### ABSTRACT

Contemporary evidence expresses that access to skilled care during the period of pregnancy and childbirth can alleviate adverse maternal outcomes. In this respect, carrying out risk profiling in the course of antenatal care and using a partogram to do intrapartum maternal-fetal surveillance are fundamental interventions that could help in early detection and management. Therefore, this study assessed composite immediate adverse maternal outcomes among women in labor referred to Kampala International University Teaching Hospital. This was a cohort study conducted among 215 pregnant women above 28 weeks in labor referred from other facilities to Kampala International University Teaching hospital with referral notes who were followed up for 72 hours after delivery. The study excluded selfreferrals and was done from September to January 2021. Data were obtained from all the participants using a questionnaire and analyzed using Stata 14.0. The analyzed data was then presented in form of frequency tables and barchart. Composite Immediate adverse Maternal outcomes among Referred women in Labor In this study APH/PPH and Anemia were the commonest outcomes seen in 9 and 8 women respectively, Followed by Hysterectomy and ICU admission Only 1 maternal death was registered during the study period. The common composite immediate adverse maternal outcomes were APH, PPH, Anemia, and Cesarean hysterectomy. Women with a compromised/unstable condition and those with gestational age less than 34 weeks ie between 28-34 weeks were likely to have maternal adverse outcomes among referred women in labor.

**Keywords:** Composite, adverse maternal, outcomes and labor.

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### INTRODUCTION

According to [1], it reported that only one patient had undergone an obstetric hysterectomy for control of post-partum hemorrhage. In addition, an audit at Abbasi Shaheed Hospital showed that during the period 3(50%) referred mothers experienced APH [2]. A prospective cross-sectional study done in Jimma University teaching hospital, South-West Ethiopia showed that the three leading obstetric complications identified were: hypertensive disorders, obstetric hemorrhage, and pregnancy-related infections [3]. While a descriptive retrospective study done on 53662 referred deliveries managed at Kilimanjaro Christian Medical Centre (KCMC) tertiary hospital in northern Tanzania between the years 2000 and 2015 found the most common maternal outcomes were PPH in 10.6% of the referred cases, Episiotomy in 5.82% of the referred cases, eclampsia in 2.77% of

the referred cases, and Abruption placenta in 1% of cases [4]. In Uganda, a prospective cohort in two referral hospitals revealed that the minority had maternal deaths and the majority were near-miss cases. Severe pre-eclampsia was the commonest morbidity followed by postpartum hemorrhage, uterine rupture caused the highest case fatality rate followed by eclampsia [5]. In addition, a prospective observational study that reviewed 780 eligible obstetric referrals found 0.6% (04) got Cesarean hysterectomy, and 0.5% (04) had postpartum hemorrhage [6]. According to a study done by [7], Anemia was the most prevalent. While the results of a study on the pattern of obstetrical emergencies and fetal outcomes in a tertiary care center revealed that a good number of the patients were transfused blood meanwhile a small percentage had

septicemia & wound infection [8]. [9] In their study reported more than half of the deaths that occurred during the study period were referred from various peripheral centers. While an audit at Abbasi Shaheed Hospital showed that 6(2.5%) maternal deaths were reported during the period [10]. A study conducted in a tertiary teaching hospital of Nepal revealed that there were 2 mortalities during the study period. The low number of mortalities could have come about due to the low number of referrals or due to the highly skilled health professionals who happened to manage the referrals appropriately. While a study done in India found only two maternal mortality occurred during the study period giving a low maternal mortality ratio. A retrospective study conducted on 5215 obstetric cases referred to the Department of Obstetrics and Gynaecology, Kamla Raja Hospital from January 2015 to April 2017 found maternal deaths were in 114 cases (2.2%) out of total referred cases [11]. Therefore, according to [1], there is a need to develop a new concept of day care management of referral cases at tertiary care institutes which might help reduce the burden of tertiary care institutes.

### **Objective**

To determine the composite immediate adverse maternal outcomes among women in labor referred to Kampala International University Teaching Hospital.

### **Research Question**

1. What are the immediate composite adverse maternal outcomes among women in labor referred to Kampala international university teaching hospital?

### **Study Design**

This was a cohort study that was hospital-based. The design allowed for describing of the independent variables which were social demographic factors, obstetric and referral factors, maternal conditions and how they associated with the dependent variables that included outcomes such as Admission to ICU, development of anemia with transfusion, APH,PPH, Caeserian

### **Justification of the Study**

Women can come across several health-related problems during pregnancy as well as become a victim of death during this process [12]. An efficient referral system provides access to treatment and skills by linking different levels of care through appropriate referrals [12]. The referral system is an essential component of any health system which is particularly important in pregnancy and childbirth for providing access to essential obstetric care. In developing countries like Uganda, the majority of the population live in rural areas lacking access to essential obstetric facilities and in such areas, timely referral and interventions to high-risk and complicated obstetric cases can reduce maternal morbidity and avoid maternal deaths. However, lack of a structured referral system is a major hurdle that delays proper management of such cases. Kampala International University Teaching Hospital is a tertiary care hospital, located in western Uganda, which receives and manages a wide spectrum of complicated obstetric cases that are referred from different centers all over the neighboring districts. This study was done as there existed minimum or no data available concerning the immediate adverse outcomes and associated factors among pregnant women in labor referred from other care centers and managed at KIU-TH. This study has contributed to efforts to reduce maternal mortality rates which may occur as a result of the adverse pregnancy outcomes thus the realization of SDG 3. For this goal to be attained, a substantial reduction in perinatal and maternal deaths is required [13].It also helps in improving maternal and child health based on the factors identified during the study.

### **MATERIALS AND METHODS**

hysterectomy and Maternal death with ultimate description of incidence, composite outcomes and factors associated with immediate adverse maternal outcomes among women in labor referred to Kampala International University teaching hospital.

### **Study Site**

The study was conducted at Kampala International university teaching hospital. KIU-TH has a bed capacity of

700, providing specialized services to both outpatient and inpatients. The study was specifically conducted at the department of obstetrics and gynecology at KIU-TH in the maternity unit. The unit offers specialized care and has a 24-hour functioning theatre. Has a team of health workers that comprises of nurses, interns doctors, senior residents, and Specialists. At the study site, several nurses are working in shifts, 1 intern doctor and senior housing officers of up to 35. On average there are about 45 patients admitted at any one time in the ward. Averagely 7 to 10 admissions per day depending on the season. It receives an average of 2-3 referrals per day from facilities such as Kitagata, Mitooma, and Kabowhe amongst other facilities found within Bushenyi district and neighboring districts.

#### Study Area

The study was conducted at Kampala International University Teaching Hospital found in Ishaka Bushenyi Municipality at approximately 60km from Mbarara town along Mbarara Kasese highway. The study population were from the districts of Bushenyi, Rubirizi, Sheema, and Mitooma as well as from the nearby districts.

#### Target Population

The study targetted pregnant women who stayed around KIU-TH and neighboring districts

#### Accessible Population

All pregnant women in labor admitted to the labor ward at KIU-TH.

#### Study Population

All pregnant women in labor admitted at the maternity unit of Kampala International Teaching Hospital who had been referred from other facilities during the time of the study.

#### Sampling Technique

Consecutive sampling technique was used to enrol all pregnant women in labor referred from other facilities. Both adults and emancipated minors who met the inclusion criteria were enrolled in the study. This technique was essential because participants were selected based on availability and willingness to take part.

#### Sample Size Determination

Daniel's formula [14] was used to determine the Sample size for the different specific objectives

$$n = \frac{(Z\alpha + Z\beta)^2 * P(1-P)}{d^2}$$

Where,

n = Minimum sample size

Z $\alpha$  = Z-statistic at  $\alpha=1.96$ ; 95% level of confidence

Z $\beta$  = Z-statistic at  $\beta = 0.84$

P = Prevalence of characteristic being estimated

d = Margin error, set at 0.05

**Objective One:** The sample size of objective one of this study was calculated using the estimated incidence based on a study done in Tanzania by [15] and the value used for P was 6.68%. Which was the incidence of referred obstetric cases.

$$n = \frac{(1.96 + 0.84)^2 * 0.0668(1 - 0.0668)}{(0.05)^2}$$

#### Selection Criteria

##### Inclusion Criteria

All pregnant women above 28 weeks in labor referred from other facilities to Kampala International University Teaching hospital with referral notes and who consented were included in this study.

##### Exclusion Criteria

Self-referrals

#### Data Collection

##### Training of Research Assistants

The data collection was conducted by the principal investigator under supervision with the help of research assistants.

##### Data collecting tools

Data from this study came from the questionnaires with close-ended questions.

##### Pre-testing

The questionnaire interview checklist and other data collection tools were pretested in the Ishaka Adventist Hospital in a similar study population for 2 weeks and necessary adjustments were made before it is used to collect the final data.

### **Data Collection Procedure**

A hospital-based prospective cohort study design was conducted. A total of 215 consecutively selected pregnant women in labor referred from other facilities took part in this study. Relevant information from the pregnant women was filled in the questionnaires after consent. Those who could not fill the questionnaire in the labor suite could do it after delivery within the stipulated time. A structured pre-tested investigator-administered questionnaire was used. Through physical general and obstetric examinations conducted and baseline characteristics of blood pressure, respiratory rate, pulse, temperature, and Glasgow coma scale were recorded. Blood sample for complete blood count taken between 48-72 hours in case the clinical diagnosis of APH/PPH and anemia was established.

### **Quality Control**

The Questionnaires were pretested the pre-tested questionnaires were used to enhance the quality of data and their results were not included in the final data analysis. The inclusion and exclusion criteria were strictly followed. The same questionnaire was applied to all participants. The consent form in both English and Runyakole languages were used. The completeness of the questionnaire was checked before data were exported to Microsoft excel. Each filled questionnaire was cross-checked for inconsistencies and incompleteness before the interview was closed.

### **Data Presentation and Analysis**

Objective One: The incidence rates of immediate adverse maternal among the pregnant women in labor were calculated as the total number of mothers who had immediate adverse maternal outcomes divided by the total number of mothers referred. Results were presented using a bar graph.

### **Ethical Considerations**

**Informed Consent and Autonomy for Participants.**

In this research, autonomy was protected by ensuring that any consent to participate in the study is informed or real. Voluntary recruitment was done and informed consent was signed. Informed consent from participants was obtained after fully explaining the details of the study to them in English

and local language (copy attached at Appendices III and IV). There was no coercion of any sort. Emancipated minors did not require the presence of their guardians to consent. Participants were not forced to enroll themselves if they did not want to. Participants were free to withdraw from the study at any time they wished without coercion or compromise of care they were entitled to.

### **Risk and Adverse Events to Study Participants.**

Being an observational prospective cohort study, the study participants were only exposed to minimal risks. The expected risk included slight pain that occurred during the drawing of a blood sample for laboratory investigations but the entire procedure was done gently and very cautiously to minimize the risks. Infections could have arisen from the site where blood was drawn from but this was curbed by observing aseptic technique during the process of blood sample collection.

### **Benefits of the Research.**

There was no direct benefit from this study. However, the participants benefitted from close monitoring and appropriate management during the study. Upon completion of the study, the findings are expected to guide stakeholders in formulating guidelines and policies basing on the evidence and recommendations from the study. These will benefit the community, department, the hospital, and the country in general.

### **Privacy and Confidentiality.**

Respondents' names were not included anywhere in the Data that was collected and; they were instead referred to using codes. The participants were interviewed separately from other clients, to maintain privacy and confidentiality.

### **Selection of Participants.**

A consecutive sampling method was used to recruit for the study. Eligibility criteria were strictly adhered to. No bias was given in terms of tribe, interest group, race, or religion.

### **Incentives and Reimbursement.**

Those who consented to take part in the study were neither paid nor given any

form of compensation for participating in the study.

#### **Approval Procedure.**

The study was carried out only after approval by the Research and Ethics Committee of KIU. Approval was also sought from the administration of Kampala International University teaching hospital where the research was conducted. Approval to carry out the study was acquired from the department of obstetrics and gynecology, the faculty and post graduate directorate and finally the KIU University Research Ethics Committee via REC NO: UG-REC- 023 /202009 as attached.

#### **Respect for Community**

The procedures involved in this study did not go against the local community's beliefs, traditions, and culture.

#### **Dissemination**

Within the study area, the results were disseminated as follows; one copy remained with the principal investigator, one copy was given to the directorate of research and post-graduate training, the supervisors were

also availed with one copy each and another copy was taken to the library. For the rest of the world to access the study results, the paper was submitted for publication in one of the peer review journals.

#### **Study limitations and delimitations**

The study was done in only one facility, but results can be generalized to other health facilities found in the region or to the inhabitants in the geographical area of the facility where the study was conducted. Not all the factors which are associated with immediate adverse maternal outcomes were addressed by the study. Notwithstanding these limitations, reliable data and appropriate scientifically sound methods were used during the study henceforth the study findings make an accurate reflection on immediate adverse maternal outcomes among pregnant women in labor referred to tertiary facilities.

Composite Immediate Adverse Maternal Outcomes among Referred women in labor at Kampala International University Teaching Hospital

**Table 1: Composite Immediate Adverse Maternal Outcomes among women Referred in labor at Kampala International University Teaching Hospital (N = 16)**

<b>Immediate Adverse Maternal Outcomes</b>	<b>Frequency (n)</b>	<b>Percent (%)</b>
<b>APH/PPH</b>	9	56.2
<b>Anemia</b>	8	50.0
<b>Hypovolemic Shock</b>	4	25.0
<b>Hysterectomy</b>	5	31.2
<b>ICU admission</b>	3	18.8
<b>Death</b>	1	6.3

Table 1 shows that of the 16 women with Immediate Adverse Maternal Outcomes referred to KIU maternity ward, enrolled, the majority had APH/PPH, 9/16(56.2%), anemia 8/16(53.3%), and hysterectomy 5/16(33.3%).

Composite Immediate adverse Maternal outcomes among Referred women in Labor In this study APH/PPH and Anemia were the commonest outcomes seen in 9 and 8 women respectively, Followed by Hysterectomy and ICU admission Only 1 maternal death was registered during the study period, a similar study

conducted by [16] in a tertiary teaching hospital of Nepal revealed that there were 2 mortalities during the study period. The findings of this study were contrary to a study by [2] at Abbasi Shaheed Hospital which found that 6 (2.5%) maternal deaths were reported. The low number of mortalities could be as a result of the low number of referrals or due to the highly skilled health professionals who happened to manage the referrals appropriately. To reduce the incidence of adverse maternal outcomes, it is indispensable to have healthcare professionals who

are well trained and skilled in emergency obstetric and newborn care (EmONC) services most especially in countries like Uganda burdened with maternal and newborn mortality. During the study period the commonest cause of morbidity were due to APH/PPH (56.2%), meanwhile, [16] reported severe pre-eclampsia as the commonest cause of morbidity followed by postpartum hemorrhage. In addition, a prospective observational study that reviewed 780 eligible obstetric referrals found 0.6% (04) got Caesarean hysterectomy, and 0.5% (04) had postpartum hemorrhage. The difference in the study findings could have come about due to the different levels of expertise among the healthcare providers and different study settings. The findings of the present study was in agreement with the results of a study conducted by [18] found that the majority of study participants had a vaginal delivery (either spontaneous or induced), as well as the results of a study conducted by [19] reported that most of the study participants had a vaginal delivery (either spontaneous or induced). The large number of study participants giving birth through vaginal delivery can be attributed to the high level of expertise of the midwives who did their best to make the women deliver normally without being taken for cesarean section.

The results of the present study were in disagreement with the results of a study conducted by [20] which showed that the cesarean delivery rate was 52% in the referred cases. Forty-three cases had a vaginal delivery out of which 3 were instrumental, they also established that Pre-eclampsia accounted for the major reason for referral which was 16% of the total followed by previous cesarean delivery and fetal distress comprising 13% each. The discrepancy in the study findings could be due to the difference

#### CONCLUSION

The incidence of adverse maternal outcome among referred women in labor at KIU-TH was relatively high. The common composite adverse maternal outcomes were APH/PPH, Anemia, and Hysterectomy. Women with a

in the study settings and the geographical areas where the studies were conducted. Contrary to this study, [21] found out that anemia was the most prevalent adverse maternal outcome. If not conducted by a competent health care provider, cesarean delivery on its own could lead to anemia thus it calls for institutions providing obstetric care to have back up of blood bank.

However, a prospective cross-sectional study done from Jimma University teaching hospital, south-West Ethiopia showed that the three leading obstetric complications identified were: hypertensive disorders, obstetric hemorrhage, and pregnancy-related infections [22]. This was different from that in Uganda in a study done in selected facilities in Uganda where obstructed labor was the 2nd leading cause of maternal Mortality and it was responsible for approximately 60% of the causes of birth asphyxia in Northern Uganda [23]. Thus, it is imperative to implement and uphold recommendations of the World Health Organization and country-specific ones to minimize maternal adverse outcomes among women in labor, particularly referred women.

Prevention is always better than cure and therefore prevention of adverse maternal outcomes saves both the mother and the unborn baby from suffering. The ministry of health recommends the use of a partograph for all mothers in active labor with no contraindication for vaginal delivery since a partograph is an inexpensive, relatively simple tool that provides a continuous pictorial overview on the progress of labor [13]. At the same time it's generally agreed worldwide that the triad of death contributing to Morbidity and mortality are obstetric hemorrhage, hypertensive diseases in pregnancy and sepsis.

compromised/unstable condition and those with gestational age less than 34 weeks ie between 28-34 weeks were likely to have maternal adverse outcomes among referred women in labor.

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