Factors associated with Immediate Adverse Maternal Outcomes among Referred Women in Labor attending Kampala International University Teaching Hospital

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ABSTRACT

Maternal adverse outcome remains a challenge in most health facilities and yet most pregnant women attend antenatal care. 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 the factors associated with immediate adverse maternal outcomes among referred women in labor attending 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 self-referrals 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. The result showed that majority of the participants 43.70% (94/215) were in the age group of 25 - 34 years and coming from rural areas of residence 88.80% (191/215). Protestants 50.2% (108/215) comprised half of the study participants with 88.80% (191/215) being married. On the other hand, the majority of participants 54.90% (118/215) were having less than secondary education as the highest level of education attained. Regarding the occupation of study participants, the majority 90.70% (195/215) were found to be unemployed with 85.10% (183/215) having a monthly income of less than 100,000. The majority of participants 62.30% (134/215) had a family size of 5 or fewer members with the husband being the one with authority for decision making in the family 62.80% (185/215). In conclusion, the incidence of adverse maternal outcomes among referred women in labor at KIU-TH was relatively high.

Keywords: Immediate, Adverse, Maternal Outcomes, Referred Women, and Labor.

INTRODUCTION

Adverse maternal outcomes have existed for decades among pregnant women referred in labor. Studies conducted in the 1970s demonstrated that timely access to risk-appropriate interventions in neonatal and obstetric care reduced perinatal mortality arising from adverse maternal outcomes [1]. This study included criteria that stratified maternal and neonatal care into 3 levels of complexity, and recommended referral of high-risk patients to higher-level centers with the appropriate resources and personnel needed to address their increased complexity of care to curb the adverse maternal outcomes among referred pregnant women in labor. Eliminating adverse maternal outcomes lies under the goal of improving maternal health which has been a global health priority for the past four decades [2], much remains to be done to lessen the harmful consequences of pregnancy and childbirth. Adverse maternal outcomes are only a small portion of the global maternal burden of ill health; it is

estimated that for each death, nearly 20 additional women suffer from life-long disabilities as a result of severe pregnancy-related morbidity [3]. This affects the quality of life of women throughout their entire remaining period. Worldwide, more than 500,000 women die of the causes related to pregnancy each year [4] and approximately 8 million women suffer from pregnancy-related complications every year [5]. In 2015, the lifetime risk of maternal death in high-income countries was 1 death per 6000 pregnant women compared to 1 death in every 36 in sub-Saharan Africa [6]. In Nigeria, estimates by the World Health Organization indicate that not only did the country not achieve Goal-5 of the Millennium Development Goals that sought to reduce maternal mortality ratio by 75% by 2015, but it also essentially witnessed a substantial increase in maternal deaths [7]. Research conducted by [8] on near-miss events in three African countries found that 83% of such cases were in a critical condition on arrival at the hospital. Similar findings are reported in studies of maternal mortality in rural Uganda [9]. A recent study in western Uganda showed 2301 live births, 45 near-miss cases, and 9 maternal deaths resulting in a severe maternal outcome ratio of 23.5/1000 live births, the maternal near-miss ratio of 19.6/1,000 live births, maternal near-miss mortality ratio of 5, and mortality index of 16.7% [10]. In Western Uganda, [11] asserts that part of the reasons for the referral of mothers in labor to tertiary care facilities may be linked to the comparative lack of resources in rural health districts as well as due to women's lower status.

Objective

To determine the factors associated with immediate adverse maternal outcomes among referred women in labor attending Kampala International University Teaching Hospital.

Research Question

1. What is the incidence of adverse maternal outcomes among referred women in labor at Kampala International University Teaching Hospital?

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

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 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 enroll 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

$$n = \frac{(Z\alpha + Z\beta)2 * \Box(1-\Box)}{\sigma\pi 2}$$

Where,

n = Minimum sample size

Zα = Z statistic at α=1.96; 95% level of confidence

Zβ = Z-statistic at β = 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.

$$\Box = \frac{(1.96 + 0.84)2 \; 0.0668(1 - 0.0668)}{(0.05)2}$$

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.

PRESENTATION AND INTERPRETATION OF THE RESULTS

Baseline Characteristics of the Study Participants

Table 1; Baseline sociodemographic characteristics of the women in labor referred to KIU-TH (N = 215)

Variable	Frequency (n)	Percent (%)
Age		
<24 years	92	42.8
25-34 years	94	43.7
≥ 35 years	29	13.5
Residence		
Urban	24	11.2
Rural	191	88.8
Religion		
Catholics	76	35.4
Protestants	108	50.2
Others	31	14.4
Marital status		
Married/Cohabiting	191	88.8
Single/divorced	24	11.2
Education		
Secondary +	97	45.1
<Secondary	118	54.9
Occupation		
Employed	20	9.3
Unemployed	195	90.7
Income		
100,000 +	32	14.9
<100,000	183	85.1
Family Size		
≤5	134	62.3
6+	81	37.7
Decision making		
Husband	135	62.8
Wife	29	13.5
Both	51	23.7

Table 1 above shows the baseline socio-demographic characteristics of the study participants. It can be observed from the table that the majority of the participants 43.70% (94/215) were in the age group of 25 - 34 years and coming from rural areas of residence 88.80% (191/215). Protestants 50.2% (108/215) comprised half of the study participants with 88.80% (191/215) being married. On the other hand, the majority of participants 54.90% (118/215) were having less than secondary education as the highest level of education attained. Regarding the occupation of study participants, the majority 90.70% (195/215) were found to be unemployed with 85.10% (183/215) having a monthly

income of less than 100,000. The majority of participants 62.30% (134/215) had a family size of 5 or fewer members with the husband being the one with authority for decision making in the family 62.80% (185/215).

Incidence of Immediate Adverse Maternal Outcomes among women Referred in labor at Kampala International University Teaching Hospital.

Table 1: have immediate adverse maternal outcome

Frequency	Percentage
16	7.44

Table 2: no immediate adverse maternal outcome

Frequency	Percentage
199	92.56

Tables 1 and 2: Immediate Adverse Maternal Outcomes among women Referred in labor at Kampala International University Teaching Hospital (N=215). This shows that of a total of 215 women enrolled, immediate adverse maternal outcomes were identified among 7.44% (16/215) of the women.

DISCUSSION

Incidence of Adverse Maternal Outcomes among Referred Women in Labor. In this study conducted among women at the labor ward of Kampala International Hospital, of a total of 215 women enrolled, the incidence of maternal adverse outcomes stood at 7.44%. This was comparable to the incidence of adverse maternal outcomes which was 8 % in a prospective longitudinal study conducted on 123 obstetric referrals at the department of Obstetrics and Gynecology of the University of Abuja Teaching Hospital, Gwagwalada from 7 November 2015 to 31 March 2016 in Nigeria by [16]. The study is comparable with a study done by [17] in Uganda at Mulago hospital among 32,511 women which found that the incidence of maternal adverse outcomes was 6%. The study incidence was low when compared to the incidence of adverse maternal outcomes according to [18] which was 15%, and a study among 135 obstetric cases referred to Adichuchanagiri Hospital in India which had an incidence rate of 21.4% by [19]. The other studies showing higher incidence compared to this study were a study by [20] in India

which found an incidence of 10%, and a study by [21] which found all referred cases having immediate adverse maternal outcomes. However, the study incidence was high when compared to results in 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 by [22] where the incidence of adverse maternal outcome was 2.2%. Another low incidence was showed by 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. Lissu & Volgsten, [23] where the incidence of adverse maternal outcomes was 1.57 %. A study carried out among 585 obstetric referrals at Hoima regional referral hospital over three months by [24] found that the incidence of adverse maternal outcomes was 1.5%. The reason for the high incidence of adverse maternal outcomes in this study could have been from using a small sample size when compared to studies showing

low incidences. This been a referral centre for most of the facilities in Bushenyi district and beyond it's expected the incidence will be high.

CONCLUSION

The incidence of adverse maternal outcome among referred women in labor at KIU-TH was relatively high.

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