

Research Article

Clinical Characteristics and Causes of Perinatal Death Among Women Who Delivered at SekouToure Regional Referral Hospital, Mwanza Region, Northwestern Tanzania

Innocent Lutakyamilwa Kaiza^{1,*}, Emmiliana Dismas Mvungi¹,
Furaha Katende Munema², Nakiete Samuel Machangu³, Ndakibae Gabriel Mabega⁴ 

¹Department of Obstetrics and Gynecology, SekouToure Regional Referral Hospital, Mwanza, United Republic of Tanzania

²Department of Surgery, SekouToure Regional Referral Hospital, Mwanza, United Republic of Tanzania

³Department of Paediatrics and Child Health, SekouToure Regional Referral Hospital, Mwanza, United Republic of Tanzania

⁴Department of Clinical Research, National Institute for Medical Research, Mwanza Research Centre, Mwanza, United Republic of Tanzania

Abstract

Background: Perinatal deaths and neonatal deaths are major public health concern worldwide. They are unexpected tragedy which brings bad experience to the pregnant mothers and the families in general. Occurrences of these deaths may be used to evaluate the quality of obstetric care given to pregnant women in the hospital. They shows good quality of obstetric care when they are low in number. Therefore, more efforts must be directed in preventing these deaths. **Methods:** This was a one-year retrospective descriptive hospital based study conducted in one of the tertiary regional referral hospital. Women who had perinatal deaths between the studied periods and meet the inclusion criteria were included. **Results:** There were 7336 deliveries in the study, 81.1% (n =5953) had vagina deliveries and 18.9% (n=1383) had Caesarean section. Total of 169 cases of perinatal deaths identified, making a rate of perinatal deaths of 23 cases per 1000 deliveries (2.3%). Among perinatal death 40% (n=67) were early neonatal deaths and there was an identified association between referral from lower health facilities with early neonatal deaths. **Conclusion:** The rate of perinatal deaths in this study was relatively low compared to other studies. This reflect the quality of obstetrics care pregnant women received in our facility. And most of these women with early neonatal deaths were referred to our facility from lower health facilities with complications.

Keywords

Perinatal Deaths, Obstetric Complications, Neonatal Care

*Corresponding author: kaizalwiza39@gmail.com (Innocent Lutakyamilwa Kaiza)

Received: 11 September 2024; **Accepted:** 29 September 2024; **Published:** 18 October 2024



1. Introduction

Perinatal death usually poses the challenges to the health care provider, institutions, families and the communities because it is one of tragedy related to complications of pregnancy and/or labor and delivery. Perinatal mortality is a major public health concern worldwide with estimated 2 million stillbirths and 1.8 million early neonatal deaths reported in 2019 [1]. Perinatal death shows unexpected new born outcomes and signifies abnormal trends from normal course of postnatal care [2]. First 7 days after newborn delivery is the most important period for both the mother and her newborn because care of mother to her infant is believed to be of the highest concern [3]. Stillbirth has been associated with extensive psychosocial consequences for parents and family, and has been linked to post-traumatic stress disorder, anxiety and depression [4]. Stillbirth rates are generally a good indicator of the quality of care before and during childbirth. The period from the onset of labor until birth is the most high-risk period for the mother and child, where 45% of all stillbirths occur [5]. Most stillbirths in LMIC are considered to be preventable through provision of quality care for all mothers and babies [6-9].

In our setting at SRRH according to Labor and NICU wards registry, unpublished data shows that there were 213 perinatal deaths between 1st May 2022 and 30th April 2023. However, there is no available information on the pregnant women characteristics and associated factors of perinatal deaths at SRRH. Thus, the aim of this study is to determine the rate of perinatal deaths, patient characteristics and factors associated with perinatal deaths among women delivered at SRRH, Mwanza Tanzania.

2. Material and Methods

2.1. Study Design

This was a one-year retrospective descriptive hospital-based study of all women who had perinatal deaths from 1st May 2022 to 30th May 2023.

2.2. Study Area and Setting

The study was conducted at SRRH. This is a regional referral hospital for Mwanza Regional. It serves all eight districts of Mwanza regional and also receives patients from nearby regions of Simiyu, Shinyanga and Geita [15]. There are at least 20 deliveries per day at SRRH, some of which are referrals from lower health facilities within the aforementioned catchment areas.

2.3. Sampling Strategy and Sample Size

Purposive sampling technique was used to get information from patients' files notes and those with adequate information

among those women with perinatal deaths were included in the study. A total of 169 patients' files were included in the study.

2.4. Data Collection

Structured data collection tool was used to collect the required information from the patient's files (case notes). All social and clinical information from each patient files were recorded.

2.5. Data Analysis

All data collected from this study were entered to the computer Microsoft excel 2007 and then be transferred into STATA version 13 for analysis. Categorical variables will be summarized into proportions and percentage while numerical variables in mean, median and standard deviation. All independent variables were exposed to univariate logistic regression model and those with p value of 0.2 or less were subjected to multivariate ordinal logistic regression model. Independent variable with p-value of less than 0.05 were considered significant.

2.6. Ethical Considerations

The study approval was sought from the Hospital's Local Ethical Review Committee at SRRH. Name and other identity of the client were anonymized for confidentiality. Consent for using secondary data were sought from the SRRH Medical officer in charge.

3. Results

3.1. Rate of Perinatal Deaths and Social Demographic Characteristics

During the one –year period of study from 1st May, 2022 to 30th May, 2023, there was a total of 7336 deliveries at SRRH, of which 81.1% (n=5953) were by vaginal deliveries and 18.9% (n=1383) were by caesarean sections.

There were 169 perinatal deaths identified during the study period, of which 60% (n=102) were fresh stillbirths and 40% (n=67) were early neonatal deaths. All of these perinatal deaths were available for various data analysis.

The rate of perinatal deaths in this study was found to be 23 perinatal deaths per 1000 deliveries (2.3%). Majority of the study population were aged below 35 years 81.7% (n=138) and above 35 years were only 18.3% (n=31) (Table 1). Most of the study population reside in urban 73.4% (n=124), and were multipara (>1) 66.3% (n=112) (Table 1). Also most of the study population had primary education 84.0% (n=142), and they were housewife 81.7% (n=138) (Table 1).

Table 1. Socio demographic characteristics of the study population (women with perinatal deaths) (N=169).

Variable	Frequency (n)	Percentage (%)
Age (years)		
<35	138	81.7
≥35	31	18.3
Parity		
Primepara (1)	57	33.7
Multipara (>1)	112	66.3
Residence		
Urban	124	73.4
Rural	45	26.6
Education		
Primary	142	84.0
Secondary/College	27	16.0
Occupation		
Housewife	138	81.7
Employed/Business	25	14.8
Peasant	06	3.5

3.2. Clinical Characteristics of the Study Population (Women with Perinatal Death)

Most of women 60% (n=102) had fresh stillbirth and 40% (n=67) had early neonatal deaths. Among those with fresh stillbirths 42.6% (n=43) came with positive fetal heart on admission and 57.4% (n=59) had no fetal hear on admission (Table 2). Among women with early neonatal deaths 58.2% (n=39) had low Apgar score after delivery and 41.8% (n=28) had normal Apgar score. Furthermore 33.3% (n=22) died within 24 hours and 66.7% (n=45) died after 24 hours (Table 2). Of all cases that were evaluated in the study population, 62.7% (n=106) were admitted at SRRH as self-referral from home while 37.3% (n=63) were admitted as referral cases from lower health facilities, moreover majority of these women had their delivery at gestation age of 37weeks or more and 56.8% (n=96) had gestational age below 37 weeks (Table 2).

Greater number of the study population had spontaneous onset of labor 84.6% (n=143) and most of them delivered by spontaneous vagina delivery 73.4% (n=124) (Table 2). Also significant number of women in the study population delivered in normal weekdays 70.4% (n=119) and others 29.6% (n=50) delivered during weekends, yet many women their deliveries were conducted by nurses (midwives) 74.0% (n=125). In the study population most of women had blood loss after delivery of less than 500mls 65.1% (n=110). More

over most of women 61.0% (n=103) delivered normal birth weight babies and 39.0% (n=66) delivered low birth weight babies (Table 2). Surprisingly in this study 31.4% (n=53) of women had no any complication during pregnancy while 68.6% (n=116) had complications in their index pregnancy (Table 3). Obstetric hemorrhages were the leading complication 39.7% (n=46), followed by pre-eclampsia/eclampsia 34.5% (n=40) and premature rupture of membranes 6.0% (n=07) (Table 3).

Table 2. Clinical characteristics of the study population (women with perinatal death) (N=169).

Variable	Frequency (n)	Percentage (%)
Patients' admission		
From home	106	62.7
From lower health facility	34	37.3
Gestation age during delivery (weeks)		
<37	73	43.2
≥37	96	56.8
Type of labor		
Spontaneous	143	84.6
Induced	23	13.6
Elective caesarean section	03	1.8
Mode of delivery		
Spontaneous vagina	124	73.4
Emergency caesarean section	42	24.2
Elective caesarean section	3	2.4
Blood loss after delivery (mls)		
<500	110	65.1
≥500	59	34.9
When delivery was conducted		
Normal weekdays	119	70.4
Weekends	50	29.6
Which time of a day was delivery conducted		
Day time	94	55.6
Night time	75	44.4
Who performed the delivery		
Nurse midwife	125	74.0
Medical officer	43	25.4
Medical specialist	01	0.6
Birth weight		

Variable	Frequency (n)	Percentage (%)
Normal	103	61.0
Low birth weight	66	39.0
<i>Type of perinatal deaths</i>		
Early neonatal death	67	39.6
Fresh stillbirth	102	60.4
<i>Apgar score among early neonatal death</i>		
Normal	28	41.8
Low score	39	58.2
<i>Duration of stay in NICU before death</i>		
Within 24 hours	22	33.3
More than 24 hours	45	66.7

Table 3. Complications in the index pregnancy among the study population (N=169).

Variable	Frequency (n)	Percentage (%)
<i>Complications in the index pregnancy</i>		
Yes	116	68.6
No	53	31.4
<i>Common complications in the index pregnancy (N=116)</i>		
Obstetric haemorrhages	46	39.7
Pre-eclampsia/eclampsia	40	34.5
Premature rupture of membranes (PROM/PPROM)	07	6.0
Prolonged labour	06	5.2
Cord prolapsed	05	4.3
Preterm labour	04	3.4

Variable	Frequency (n)	Percentage (%)
Ruptured uterus	02	1.7
Severe anemia	02	1.7
Others	04	3.4

3.3. Causes of Early Neonatal Deaths

In our study, we found that the leading cause of early neonatal deaths was intrapartum asphyxia 45.4% (n=31). The second cause was respiratory distress syndrome 19.7% (n=13) followed by neonatal sepsis 15.2% (n=10) and prematurity 12.1% (n=08) (Table 4). Other causes of early neonatal deaths are shown in (table 4) below.

Also, in this study it was found that among those newborns with low Apgar score, significant number of them died after 24 hours 60.0% (n=24), as compared to 40% (n=15) who died within 24 hours (Table 5).

Table 4. Causes of early neonatal deaths among neonates admitted in NICU (N=67).

Causes of early neonatal deaths	Frequency (n)	Percentage (%)
Intrapartum asphyxia	31	45.4
Respiratory distress syndrome	13	19.7
Neonatal sepsis	10	15.2
Prematurity	8	12.1
Meconium aspiration	4	6.1
Low birth weight	1	1.5

Table 5. Apgar score against duration of stay in NICU among early neonatal deaths (N=67).

<i>Duration of stay in NICU</i>			
Apgar score	Within 24 hours	More than 24 hours	Total
Normal	06 (18.5%)	22 (81.5%)	27 (45.0%)
Low score	15 (40.0%)	24 (60.0%)	40 (55.0%)
Total	21 (31.3%)	46 (68.7%)	67 (100%)

4. Discussion

In this study the rate of perinatal deaths was found to be 23 deaths per 1000 births (2.3%) which is almost similar to the study done in Pemba Tanzania in 2019 which was 22 deaths per 1000 births (2.2%) [12]. This rate of perinatal deaths is lower than that reported in Uganda in 2007 which was 70 deaths per 1000 births and also lower than the world's average estimate of 26.7 deaths per 1000 births [1, 11], although it seems to be higher than that reported in Georgia which was 13.6 deaths per 1000 births in which this rate is the highest reported in Europe [10]. The observed differences in rates of perinatal deaths could be due to differences in sample size and quality of obstetric services between these settings. Another explanation could be some women decided to send their new born who had early complications in their nearby health facilities. Majority of women in this study 68.6% had complication during pregnancy and/or delivery. This could be because most of women were educated about the danger signs during pregnancy when they attended routine ANC visits and were instructed that whenever they had any danger sign they have to go to the tertiary hospital. That is why most of them had complications but they came as self-referral from home.

With regard to early neonatal deaths, the study found that, the leading cause of neonatal deaths was intrapartum asphyxia 45.4% followed by respiratory distress syndrome 19.7%. These findings are similar to the study done in 35 hospitals in Tanzania by Chacha D et al [13]. Possible explanations for these findings could be, in our study majority of women had obstetrics hemorrhages, pre-eclampsia/eclampsia and premature rupture of membranes as complications in their index pregnancy that may increase risks of stillbirths. This finding is similar to Chuwa et al, [14]. Also, in this study it was found that most of early neonatal deaths among those with low Apgar score occurred after 24 hours 60% compared to 40% which occurred within 24 hours. The possible explanations for this could be there is significant improvements in knowledge of neonatal resuscitation and managements of sick newborn among health care workers in labor ward and in our NICU ward.

5. Conclusion

The rate of perinatal deaths in this study was relatively low as compared to other studies. Those pregnant women who were referred from lower health facilities were observed to be associated with early neonatal deaths.

6. Recommendation

There is a need of the same study to be done in other facilities within the region so as to establish the true burden of perinatal deaths. There is a need to work restless from the

level of antenatal clinics up to tertiary hospitals so as to emphasize on the strategies to reduce perinatal deaths.

Abbreviations

ANC	Antenatal Care
APH	Ante Partum Hemorrhage
C/S	Caesarean Section
DM	Diabetic Mellitus
EHMS	Electronic Health Management System
HTN	Hypertension
LMICs	Low- and Middle-Income Countries
MMR	Maternal Mortality Rates
NICU	Neonatal Intensive Care Unit
OBGY	Obstetrics and Gynecology
PPH	Postpartum Hemorrhage
PND	Perinatal Death
SRRH	SekouToure Regional Referral Hospital
SVD	Spontaneous Vaginal Delivery
USA	United States of America

Acknowledgments

The authors would like to acknowledge all people who participated in this study, particularly Medical officer in-charge-SRRH, Regional administrative secretary and those who participated in the work of this research.

Author Contributions

Innocent Lutakyamilwa Kaiza: Conceptualization, Data curation, Formal Analysis, Fund acquisition, Methodology, Software, Validation, Visualization, Writing original draft, Writing-review and editing

Emmiliana Dismas Mvungi: Methodology, Supervision, Validation, Writing-review and editing

Furaha Katende Munema: Data curation, Formal Analysis, Methodology, Supervision, Validation, Visualization, Writing-original draft, Writing-review and editing

Nakiete Samuel Machangu: Methodology, Supervision, Validation, Visualization, Writing-review and editing

Ndakibae Gabriel Mabega: Investigation, Methodology, Validation, Writing-review and editing

Declaration

The study approval was sought from the Hospital's Local Ethical Review Committee at SRRH. All methods were carried out in accordance with relevant guidelines and regulations, name and other identity of the client were hidden to keep confidentiality. The benefits that were obtained from the study for using secondary data outweigh their risks.

Consent for Publication

All authors read the manuscript and approved it for Publication.

Data Availability Statement

The datasets used and analysed during the study are available from corresponding author on request.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). A neglected tragedy: the global burden of stillbirths. New York: United Nations Children's Fund; 2020.
- [2] Rodríguez JG, Trobo AR, García ML, Martínez MC, Millán CP, Vázquez MC, et al. The effect of performance feedback on wound infection rate in abdominal hysterectomy. *American journal of infection control*. 2006; 34(4): 182-7. <https://doi.org/10.1016/j.ajic.2005.09.011>
- [3] Organization WH. Postpartum care of the mother and the newborn: a practical guide. Geneva: World Health Organization, 1998. 81 p. WHO/RHT/MSM/98.3.
- [4] Gold K. J., Boggs M. E. & Lieberman R. W., 2014. Assessment of "fresh" versus "macerated" as accurate markers of time since intrauterine fetal demise in low-income. *International Journal of Gynecology and Obstetrics*, 125(3), pp. 223–227. <https://doi.org/10.1016/j.ijgo.2013.12.006> Epub 2014Mar4.
- [5] Stillbirths: Where? When? Why? How to make the data count? *The Lancet*. 2011; 377(9775): 1448–63. [https://doi.org/10.1016/s0140-6736\(10\)62187-3](https://doi.org/10.1016/s0140-6736(10)62187-3)
- [6] Reinebrant HE, Leisher SH, Coory M, Henry S, Wojcieszek AM, Gardener G, et al. Making stillbirths visible: a systematic review of globally reported causes of stillbirth. *BJOG*. 2018; 125: 212–24. <https://doi.org/10.1111/1471-0528.14971>
- [7] Ugwa EA, Ashimi A. An assessment of stillbirths in a tertiary hospital in northern Nigeria. *J Matern Fetal Neonatal Med*. 2015; 28: 1585–8. <https://doi.org/10.3109/14767058.2014.961416>
- [8] Musafili A, Persson L-Å, Baribwira C, Pääs J, Mulindwa PA, Essén B. Case review of perinatal deaths at hospitals in Kigali, Rwanda: perinatal audit with application of a three-delays analysis. *Musafili et al. BMC Pregnancy Childbirth*. 2017; 17: 85. <https://doi.org/10.1186/s12884-017-1269-9>
- [9] Lori JR, Rominski S, Osher BF, Boyd CJ. A case series study of perinatal deaths at one referral center in rural post-conflict Liberia. *Matern Child Health J*. 2014; 18: 45–51. <https://doi.org/10.1007/s10995-013-1232-y>
- [10] Manjavidze T, Rylander C, Skjeldestad FE, et al. Incidence and causes of perinatal mortality in Georgia. *J Epidemiol Glob Health*. 2019; 9: 163–168. <https://doi.org/10.2991/jegh.k.190818.001>
- [11] Mbonye AK, Mutabazi MG, et al. Declining maternal mortality ratio in Uganda: Priority interventions to achieve the Millennium Development Goal. *International Journal of Gynecology and Obstetrics* 2007. 96: 285-290. <https://doi.org/10.1016/j.ijgo.2007.05.019>
- [12] Tine BS, Charlotte CHH et al. Risk factors of stillbirths in four district hospitals on Pemba Island, Tanzania: a prospective cohort study. *BMC Pregnancy and childbirth* 2023. 23: 288. <https://doi.org/10.1186/s12884-023-05613-6>
- [13] Chacha DM, Susan FR et al. Trends, patterns and cause-specific neonatal mortality in Tanzania: a hospital-based retrospective survey. 2021; 13: 334-343. <https://doi.org/10.1093/inthealth/ihaa070>
- [14] Francisca SC, Amasha HM et al. Maternal and fetal risk factors for stillbirth in Northern Tanzania: A registry-based retrospective cohort study 2017; 12(8): e0182250. <https://doi.org/10.1371/journal.pone.0182250>
- [15] NBS O. 2012 population and housing census: Population distribution by administrative units: Key findings. National Bureau of Statistics and Office of Chief Government Statistician Zanzibar, Dar es Salaam; 2013.