Maternals risk factors associated with perinatal mortality at Kyeshero general referral hospital in Goma

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Abstract

Introduction: Health system deterioration and population worsening socioeconomic conditions due to chronic armed conflict impact maternal and child health in Eastern Democratic Republic of Congo. Objectives were to identify newborns and mother's profile and analyze maternal factors associated to perinatal mortality at Kyeshero General Referral Hospital in Goma.

Methodology: This control case study covered 12 months from January 1st to December 31st, 2020. By using KoBoToolbox 250 newborns were included in this series. Cases were 32 newborns died in perinatal period and control-cases 218 survivor newborns. Analysis was done in Epi-info version 7.0 and (SPSS) version 21. Chi-square test (X^2) was applied in this study.

Results: Perinatal mortality 12.8 %. Significant maternal risk factors associated perinatal mortality were maternal age X^2=89.181, admission mode X^2=18.164, antenatal care (ANC) less than $3X^2$=15.182, parity X^2=3.688 and maternal antepartum condition X^2=75.98.

Conclusion: Perinatal mortality proportion remains high in our context. Half of the deaths are stillbirths, and the other half are early neonatal deaths. Regarding this findings, additional efforts must be focused on the quality of ANC especially in antepartum period, intrapartum period and post-partum period. Also, essential newborn care still a critical intervention for babies.

Introduction

Perinatal mortality defined as a fetus death occurring after 28 weeks of gestation (stillbirth) add early neonatal death remains challenging through the world [1,2]. It is one of the indicators often used for assessing maternal and child health in any country. Word Health Organization (WHO) in 2019, enrolled 2 million stillbirth and 1.8 million early neonatal deaths which represent approximately 4,932 newborn deaths per day [3-5]. The perinatal death rate has declined over the past 30 years and the stillbirth rate has been relatively stable. However, the rate of stillbirth is 10 times higher in developing countries compared to developed countries [6].

Neonatal survival chance can be enhanced by implementing simple interventions such as mother education, recentered antenatal care, safe delivery practice, essentials newborns care, decrement in poverty, empowerment of females and progress efforts of providing excellent maternal and child health services [7].

In sub-Saharan Africa countries, despite perinatal mortality being a major public health concern, few studies document the incidence and maternal factors associated with perinatal mortality. In Nigeria, perinatal mortality rate (PMR) increased from 39 per 1000 births in 2008 to 41 per 1000 births in 2013 representing approximately five percent increase over the five-year period [8-11]. This Nigerian perinatal mortality is higher than Ethiopian's rate reported. This

country is one of the top perinatal death reporting countries in Africa [12]. For sure, the country has made remarkable progress in term of reduction of the burden of maternal and perinatal death in the last two decades. According to the Ethiopian Demographic and Health Survey (EDHS), the estimated perinatal death is around 33 deaths per 1000 live birth, with notable regional variation due in most case to preventable risk factor included maternal age, place of delivery, maternal health condition, lack of antennal visit, low maternal education level and delay to decide to seek care [13-15].

In Democratic Republic of Congo, armed conflicts impact negatively maternal and child health, especially the mother education level, employment and socio-economic status of the population and poor care access for pregnant woman resulting a higher perinatal mortality rate [16]. Additional factors are insecure professional environment, lack of qualified medical staff, no availability of blood blank, and limited access to essential drugs supplies for excellent comprehensive emergency obstetric and neonatal care [17,18].

Table 1. Socio-demographic profile of neonates

Variables	N= 32	100%
Gender		
Male	20	62.5
Female	12	37.5
Birth route		
Normal	20	62.5
Cesarean section	12	37.5
Birth weight (grams)		
<1500	17	53.1
1500- 2499	8	25
≥ 2500	7	21.3
Moment of death		
Antepartum period	5	15.6
Intrapartum period	11	34.4
Early neonatal period	16	50

Also, few authors report on risk factors associated with perinatal mortality in North-Kivu region, except Kahiririaa, et al. [19] who found a high perinatal mortality rate of 42.3 deaths per 1000 live births at Beni General Referral Hospital [19], similar to national perinatal mortality rate of 40 deaths per 1000 live births [20], higher than 32 deaths per 1000 live births observed in Bukavu, lower than 27 deaths per 1000 live births documented in Lubumbashi city [21,22].

However, rare study done at Kyeshero General Referral Hospital in Goma city, large understanding of significant determinants of perinatal deaths at this health facility, would help caretaker to reduce both stillbirth and early neonatal mortality outcomes. Aim of this research is to identify newborns and mother's profile and analyze maternal factors associated to perinatal mortality at Kyeshero General Referral Hospital in Goma city.

Materials and methods

Setting, study design, and period

This control case study investigated maternal risk factors associated to perinatal mortality at Kyeshero Referral Hospital in Goma city, Eastern part of Democratic Republic of Congo, which is an area of longstanding armed conflict and insecurity. The study covers 12 months from January 1st to December 31st, 2020.

Population, sample size and eligibility criteria

In this study, we enrolled 250 newborns were enrolled in this series. Cases were 32 newborns died in perinatal period and control-cases 218 survivor newborns in early neonatal period. Any newborn who died after the early neonatal period and any newborn admitted in the perinatal uncompleted files were excluded in this study.

Data collection and analysis

We used KoBoToolbox to collect data. Coded and checked data were done in Epi-info version 7.0, then data were exported in statistics product and service solution (SPSS) version 21 for analysis. Chi-square test was applied in this study. The null hypothesis (H0) was rejected if the calculated Chi-square was greater than 3.84 or P > 0.05 (significant dependence existed). On the other hand, the null hypothesis (H0) was accepted when the calculated Chi-square was less than 3.84 or P < 0.05 (significant independence).

Variables

Independents variables retained and analyzed were maternal age, mode of admission, antenatal care, parity, maternal antepartum conditions and delivery. Dependent variable was perinatal mortality.

Ethical considerations

Approval to conduct this research was obtained from Kyeshero Referral Hospital authority and confidentiality was observed during our data collection.

Findings

Perinat mortality rate

From 250 newborns included in this study, 32 died, which representing a perinatal mortality rate of 12.8% at Kyeshero General Referral Hospital.

Most proportion of newborn is male 62.5%, normal birth route 62.5%, lower birth weight 78.7%. Half of the deaths (50%) are stillbirths, and the other half (50%) are early neonatal deaths (Table 1).

Most women included in this study were between under 18 years old 46.9%, housewives 31.3%. They have less than 3 ANC 53.1%. A large proportion were referred by other primary health care center 56.2% (Table 2).

Significant maternal risk factors associated perinatal mortality are maternal age under 18 years, admission by referral mode, ANC less than 3, primiparity and prolonged rupture of membranes ≥ 18 hours (Table 3).

Results and discussion

Perinatal mortality rate

Without reducing perinatal mortality rate, it is not possible to reduce neonatal mortality rate, infant mortality rate and under 5 mortality rates. In our study, from 250 newborns included in this study, 32 died, which representing a perinatal mortality rate of 12.8% at Kyeshero General Referral Hospital. Half of the deaths (50%) are stillbirths, and the other half are early neonatal deaths (50%). This observation is not confirmed at Nepal, where Manisha, et al. found 70% still births, 15.5% early neonatal onset death in 24 hours of birth and rest of deaths occurred between 2-7 days after birth. Moreover, pregnancy and delivery related causes were responsible for 21% of perinatal death. Women who had less than two visits were more likely to experience perinatal death than those who had more visits [23].

Table 2. Sociodemographic mother profile

Variables	N=32	100%
Age (years)		
< 18	15	46.9
19- 34	5	15.6
≥ 35	12	37.5
Occupation		
Housewife	10	31.3
Trader	7	21.9
Student	5	15.6
Famer	3	9.3
No job	7	21.9
Antenatal care		
<3	17	53.1
≥3	15	46.9
Parity		
Primiparity (1st delivery)	10	31.3
Normal parity (2-4deliveries)	13	40.6
Multiparity (≥ 5 deliveries)	9	28.1
Mode of admission		
Referred	14	43.8
No referred	18	56.2

Table 3. Maternal risk factors associated

Maternal factors	Case n=32	Case -Control n=218	Total N=250	X^2	Dff
Age (years)					
<18	15	6	21	87.2	2
19-34	5	179	184		
≥ 35	12	33	45		
Mode of admission					
Referral	14	3	4	18.163	1
No referral	1	36	47		
Antenatal care < 3					
Yes	8	18	26	15.182	1
No	4	21	25		
Parity					
Primiparity	10	52	62	3.688	1
Normal parity	13	127	140		
Multiparity	9	39	48		
Antepartum conditions					
PROM ≥18 hours	10	6	16	75.98	4
Genitourinary infection	8	98	106		
Prolonged labor	6	17	23		
Genital bleeding	4	0	4		
No conditions	4	97	101		
Delivery route					
Normal	24	179	203	0.923	1
Cesarian section	8	39	47		

Perinatal mortality is an important indicator for monitoring progress towards 2030 Sustainability Development Goal number 3 (SDG3), which aim's is to reduce child mortality especially in low-income countries facing significant challenges. These challenges included limited access to essential health services for mother and child, weak health systems, lack of resources, including insufficient funding. Furthermore, political instability, armed conflict, starving, malnutrition and inequitable income distribution are additional factors observed in many Sub-Saharan countries including our context.

Addressing SDG3 requires increased equitable funding for universal health coverage, mother and child healthcare infrastructure, efficient resource allocation, improved priority setting, reduction in corruption [24], implementation of integrated services in facilities, promoted intersectoral collaboration, use of outreach campaigns, community health workers and trained traditional, clear political support for child survival investments, well-coordinated relationships with external partners [25] and training for healthcare [26].

Maternal risk factors

Significant maternal risk factors associated perinatal mortality are maternal age under 18 years, admission by referral mode, ANC less than 3, primiparity and prolonged rupture of membranes ≥ 18 hours. Similar findings are reported by several authors adding uterine rupture, obstructed labor, maternal education level, marital status, geographic residency, poor socio-economic condition, cigarette smoking, heart disease, TORCH infection, sexually transmitted diseases [23,27-29]. These finding could be explained by several factors in our context. Pregnant adolescents are at highe risk for preeclampsia, eclampsia, genitourinary tract infection, and maternal malnutrition. Women > 35yrs are exposed hypertension, diabetes, obesity, macrosomia increasing higher risk uterine rupture, preeclampsia and placenta praevia neonatal and maternal deaths. Early and regular antenatal care attendance is recognized as a crucial intervention associated to better maternal and neonatal outcomes. World Health Organization (WHO) recommended at least 4 ANC from the first trimester of pregnancy. These provided services are effective and useful for prevention of mother complication, early diagnosis, and treatment of pregnancy-related problems.

Conclusion

Perinatal mortality proportion remains high in our context. Half of the deaths are stillbirths, and the other half are early neonatal deaths. Regarding this findings, additional efforts must be focused on the quality of ANC especially in antepartum period, intrapartum period and post-partum period. Also, essential newborn care still a critical intervention for babies.

Authors' contributions

All authors were part of the conceptualization and execution of this research. Mashako Many drafted the first version of the manuscript, and all authors reviewed and substantially contributed to the final draft.

Conflicts of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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