Epidemiological Profile of Childbirth among Primiparous Women in Rural Areas of Tanganyika Province, Democratic Republic of Congo

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Abstract

Introduction: Sub-Saharan Africa remains one of the areas where maternal deaths are most prevalent. This situation is linked to a number of maternal risk factors including obstetric experience, age, disease history, socio-economic conditions and the quality of the health system. The objective of this study is to determine the epidemiological profile of childbirth in rural primiparous women. **Methods**: This is a multi-centre, retrospective and descriptive cross-sectional study among primiparous women in Moba (DR. Congo). The period from 2015 to 2016 was chosen. Epi Info 7 and Excel software were used for data analysis. **Results**: Of the 2644 deliveries selected for this study, 474 (17.9%) were among primiparous women. The average age of primiparous women was 18.4 ± 1.9 years (extremes 15 to 24 years). The majority of primiparous women were educated, married, housewives, with poor prenatal

monitoring of pregnancies, having given birth by eutocic mode (53.6%) and vaginal route (92.0%). Maternal and early neonatal mortality was 0.8% and 1.7% respectively. This mortality only significantly ($p < 0.05$) concerned dystocic deliveries and the 18- to 21-year-old age group. Maternal age ($p < 0.001$), especially before the age of 18 ($p < 0.000$), and occupation ($p < 0.01$) significantly determine the mode of childbirth. **Conclusion**: The primiparous under 18 years of age presents risks of dystocic childbirth. Dystocia is responsible for several complications that can lead to maternal or neonatal death. Efforts should be made to discourage early pregnancy and improve the quality of obstetric care.

Subject Areas

Epidemiology, Gynecology & Obstetrics, Public Health

Keywords

Childbirth, Epidemiology, Primiparous, DRC

1. Introduction

Maternal and child health occupies an important place in each country's health development plans (HDPs). Childbirth is the set of mechanical (uterus, foetus, maternal pelvis) and physiological phenomena that result in the foetus and its appendages leaving the genital tract from the age of viability [1] [2]. It remains a mystery of reproduction that has fascinated humans since ancient times [3] and constitutes an essential and final stage of pregnancy with a gestational age of at least 22 or 28 weeks of amenorrhoea (SA) [2] [4].

The course of childbirth depends on a number of factors including obstetrical experience (gestational age, parity), maternal age, surgical history, nature of uterine contractions, position of the foetus in utero, etc. [5] [6] [7] [8]. In the context of this study, it concerns deliveries of primiparous women.

A primiparous woman is defined as a woman giving birth for the first time [7] [9]. She occupies an important place in the transition to obstetric experiences for every woman.

Indeed, the first pregnancy and the first birth are real public health problems given the seriousness of the facts surrounding them. Several studies have established links between parity and the occurrence of certain morbid circumstances in the mother (caesarean section, depression, lesion of the perineum, eclampsia, etc.) and the foetus (prematurity, low birth weight, congenital malformations, etc.) [6] [7] [10] [11] [12] [13]. As a result, primiparity is a high-risk factor for pregnancy and childbirth, especially in developing countries and countries south of the Sahara such as the Democratic Republic of Congo [7] [13] [14].

Indeed, in developing countries, the quality of obstetric care is not always satisfactory and maternal and infant mortality rates remain very high [7] [15] [16]. This makes it imperative to undertake efforts to improve the quality of obstetric-

al care and thus achieve the 2016-2030 objectives of sustainable development, as a logical follow-up to the Nairobi conference on maternal mortality.

In a study conducted in urban Lubumbashi (DR Congo) from 2013 to 2014, the authors concluded that "the delivery of primiparas remains an obstetric problem" [7].

It is within this framework that this study was finally initiated to contribute to the health of mother and child. The aim of this study is to determine the epidemiological profile of childbirth among primiparous women in rural areas, particularly in the city of Moba, Tanganyika province, in the Democratic Republic of Congo.

2. Methodology

2.1. Setting, Type and Period of Study

This study is multi-centric, retrospective and cross-sectional descriptive at the same time. It was carried out in two hospitals in the city and territory of Moba (Tanganyika province, south-eastern DRC) over a period of two years, from 2015 to 2016: Katombe Health Centre and Moba General Reference Hospital (HGR) in the rural commune of Kirungu. These two health structures are an integral part of the Moba health zone.

The Moba General Hospital, located in the rural commune of Kirungu, is the largest reference structure in the Moba territory (24,500 Km² and 609,406 inhabitants) and covers two health zones: Kansimba and Moba. The population lives mainly from agriculture and fishing on Lake Tanganyika.

In terms of human resources, almost all levels of education are found there (A3, A2 and A1) among the providers. However, only the HGR in Moba has general practitioners. The Moba HGR maternity hospital has a capacity of 18 beds.

2.2. Study Population

Our study population was made up of births that had attended the maternity wards of the Katombe and HGR health centre in Moba. The sample was exhaustive and systematic throughout the period covered by this study, *i.e.* 474 women. Any woman who had given birth in these facilities during the period in question and who had collected the study variables was included. The data collection for this study was carried out on the basis of antenatal care (ANC) registers, birth registers and partograms.

2.3. Study Variables (Parameters)

For this study, the following information was sought for each selected birth: age, level of education, marital status, occupation, parity, number of antenatal care (ANC) followed during pregnancy, types and modes of delivery (eutocic or dystocic), routes of delivery (high or low), the evolution of post-partum births and of newborns in the early neonatal period.

On the subject of parity, we distinguish, according to obstetrical experiences: The Primiparous: 1 delivery; the Pauciparous: 2 - 3 deliveries; the Multiparous: 4

- 6 deliveries; and the Grand Multiparous: at least 7 deliveries.

Data was collected from birth registers, partograms and for some women interviews were necessary.

2.4. Data Processing and Statistical Analysis

The data collected on a pre-established form for our study were encoded on the Excel spreadsheet (Microsoft, version 2010, USA) to be imported into the Epi Info 7.1 software (Center for Disease control and prevention, Atlanta, USA, 2012) [17]. Descriptive analysis of the results was carried out to obtain the frequency (percentage) of deliveries in primiparous women and the parameters of position and dispersion (mean, extremes, median, standard deviation). The relationships between the variables studied were assessed using p-value. The significance threshold was chosen at ≤0.05 for the alpha error.

2.5. Research Ethics

The principles of scientific research had been respected during this study. In the absence of a structure in charge of regulating universal measures of research ethics in biomedical sciences, we had obtained the authorisations of the managers of the structures concerned by this study (Katombe Health Centre and the gynaecology and obstetrics department of the Moba General Reference Hospital). The anonymity of the identities and information obtained from the women's medical records had been respected.

3. Results

3.1. Frequency and Socio-Demographic Characteristics of Primiparous Women

During the period of our study, 2644 births were recorded. The majority of deliveries were multiparous (n = 1310 or 49.5%) followed by pauciparous (n = 534 or 20.5%), primiparous (n = 474 or 17.9%) and large multiparous (n = 306 or 11.6%). Thus, the frequency of primiparity in our study series was 17.9% (Figure 1).

According to Table 1, the majority of births were between 18 and 21 years of age, with an overall average of 18.4 ± 1.9 years and extremes of 15 to 24 years. Minor mothers, *i.e.* under 18 years of age, were represented at 33.3% (n = 158 and 14 - 17 years of age). In 79.7% (n = 378), the births were at secondary school level (post-primary). Married women were the most common (n = 344 or 72.6%). With regard to occupation, housewives in the home were the most encountered (n = 342 or 72.2%) and students 18.1% (n = 86).

3.2. Monitoring of ANCs by Primiparous

According to Table 2, the majority of births were attended by ANC, 98.3% (n = 466) compared to 1.7% (n = 8) who did not attend ANC. Births with a single ANC (n = 222 or 46.8%) were the most represented, followed by two ANCs (n = 160 or 33.8%) and three ANCs (n = 84 or 17.7%). No woman had achieved 4 ANCs during the gestational period. The average ANC was 1.7 ± 0.8.
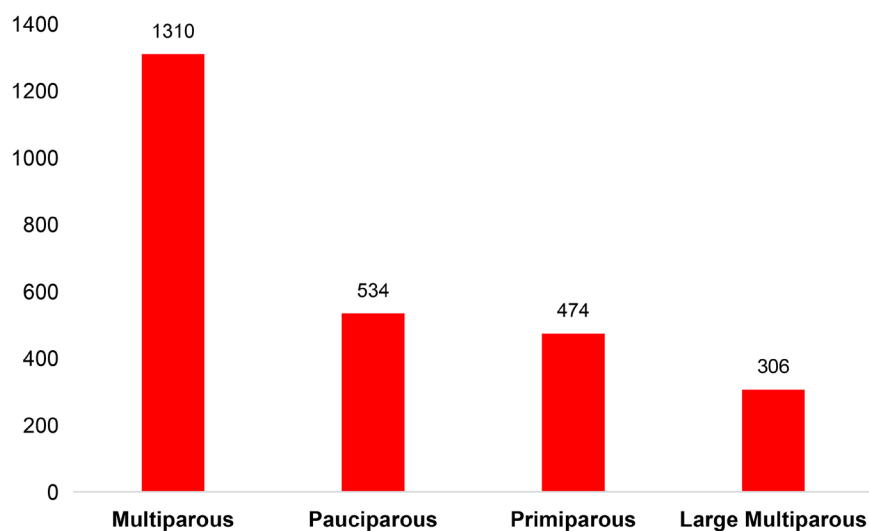
Figure 1. Parity of women (n = 2644).

Table 1. Socio-demographic characteristics and modes of delivery.

| Characteristics | Types or modes of childbirth (Deliveries) | | | |
	Total n (%)	Eutocic n (%)	Dystocic n (%)	p-value
Age (Years)				
14 - 17*	158 (33.3)	66 (41.8)	92 (58.2)	
18 - 21	286 (60.3)	170 (59.4)	116 (40.6)	
22 - 25	30 (9.3)	18 (60.0)	12 (40.0)	
Total	**474 (100)**	**254 (53.6)**	**220 (46.4)**	0.0007
Median	18.4	19.5	18.5	
Average (Means)	18.4	18.7	18.1	
SD**	1.9	1.9	2	
Extremes	15 - 24	16 - 24	15 - 23	
Level of education				
Illiterate	18 (3.8)	10 (55.6)	8 (44.4)	
Primary	78 (16.5)	34 (43.6)	44 (56.4)	0.2072
Secondary	378 (79.7)	210 (55.6)	168 (44.4)	
Higher and university	-	-	-	
Marital status				
Single	130 (27.4)	72 (55.4)	58 (44.6)	0.6303
Married	344 (72.6)	182 (52.9)	162 (47.1)	
Profession				
Housewife at home	342 (72.2)	188 (55.0)	154 (45.0)	
Student	86 (18.1)	48 (55.8)	38 (44.2)	0.0072
Teacher	12 (2.5)	4 (33.3)	8 (66.7)	
Cultivator	8 (1.7)	4 (50.0)	4 (50.0)	

Continued

Trader	4 (0.8)	-	4 (100)
None	12 (2.5)	-	12 (100)
Undetermined	10 (2.1)	10 (100)	-

*14 - 17 and 18 - 25 years old: p 0.0000; SD**: Standard deviation.

Table 2. ANC monitoring and types of deliveries.

ANC	Total n (%)	Deliveries n (%)		p-value
		Eutocic	Dystocic	
None	8 (1.7)	-	8 (100)	
1	222 (46.8)	132 (59.5)	90 (40.5)	
2	160 (33.8)	78 (48.8)	82 (51.2)	0.5185
3	84 (17.7)	44 (52.4)	40 (47.6)	
4	-	-	-	
Total	474 (100)	254 (53,6)	220 (46,4)	

Means: 1.7 ± 0.8.

Table 1 shows that eutocic births were the most represented compared to dystocic births (254 or 53.6% vs. 220 or 46.4%). Dystocic births were more common in the 14 - 17 age group (n = 92 out of 158 or 58.2%) with an average of 18.5 ± 2 and extremes of 15 - 23 years. Eutococcal births were mainly found among those aged 18 and over (18 to 24 years) with an average of 18.7 ± 1.9 years and extremes of 13 to 24 years.

Compared to the delivery route in primiparous women, the lower route was significantly ($p < 0.05$) the most used (n = 436 or 92.0%) compared to 8.0% (n = 38) for the upper route or caesarean section (Figure 2). The age (p 0.0007) and the occupation (p 0.0072) of the births determine the mode of delivery.

3.3. Deliveries in Primiparous Women

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3.4. Evolution of Primiparous and Newborns (Early Neonatal Period)

According to Table 3, in the majority of cases the evolution was good for
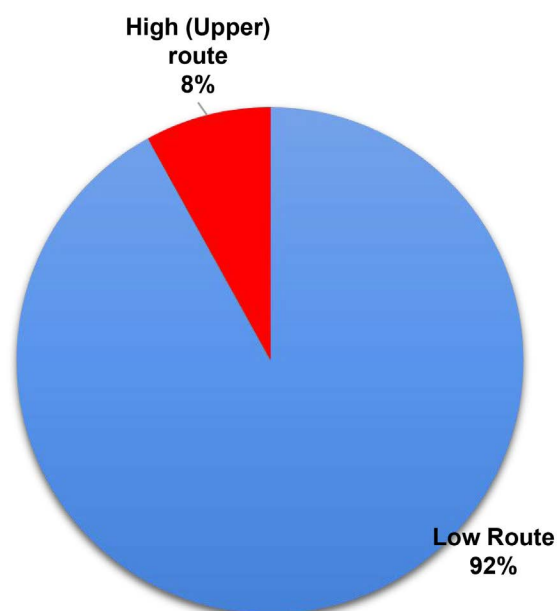
Figure 2. Pathway of delivery (n = 474); p < 0.05.

**Table 3.** Types of childbirth and maternal-neonatal evolutions (early).

Delivery Modes	Mother n (%)				Newborn n (%)			
	Good	Bad**	Death	P-v*	Good	Bad†	Death	P-v*
Eutocic n = 254 (%)	222 (87.4)	32 (12.6)	-	S***	236 (92.9)	18 (7.1)	-	S****
Dystocic n = 220 (%)	164 (74.5)	52 (23.6)	4 (1.8)		132 (60.0)	80 (36.4)	8 (3.6)	
Total n = 474 (%)	386 (81.4)	84 (17.7)	4 (0.8)		368 (77.6)	98 (20.7)	8 (1.7)	

p-v*: p-value; ****:** Postpartum haemorrhage, puerperal infection, tear of the perineum, tear of the cervix, etc.; **S***:** Significant 0.0205; **S****:** Significant 0.0001; **†:** Respiratory distress, anemia, hypoglycemia, etc.

primiparous mothers (n = 386 or 81.4%) and their newborns (n = 368 or 77.6%) during the neonatal period. In 17.7% (n = 84) and 20.7% (n = 98) of cases, the evolution was bad, respectively for primiparous and newborn babies. Respiratory distress, anaemia and hypoglycaemia for newborns and delivery haemorrhages, puerperal infections, tears of the perineum and cervix, etc. for primiparous women were among the morbid elements that had favoured this poor evolution in our series (Table 3).

Mortality was 1.7% (n = 8) for newborns and 0.8% (n = 4) for primiparous women. All postpartum and early neonatal maternal deaths were recorded in the category of dystocic deliveries (Table 3).

The mode of delivery was determinant in maternal (p 0.0205) and early neonatal (p 0.0001) outcomes. On the other hand, maternal age was not associated with neonatal (p 0.4194) and maternal mortality (p 0.5591). All of the eight newborn deaths occurred in mothers aged 18 - 21 years (Figure 3 and Figure 4).
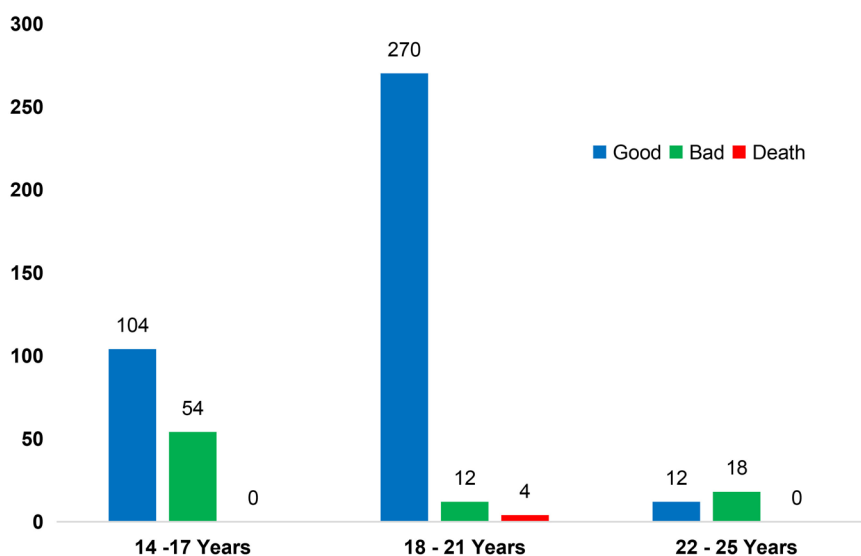
Figure 3. Maternal age and evolution (n = 474); p-value = 0.5591.
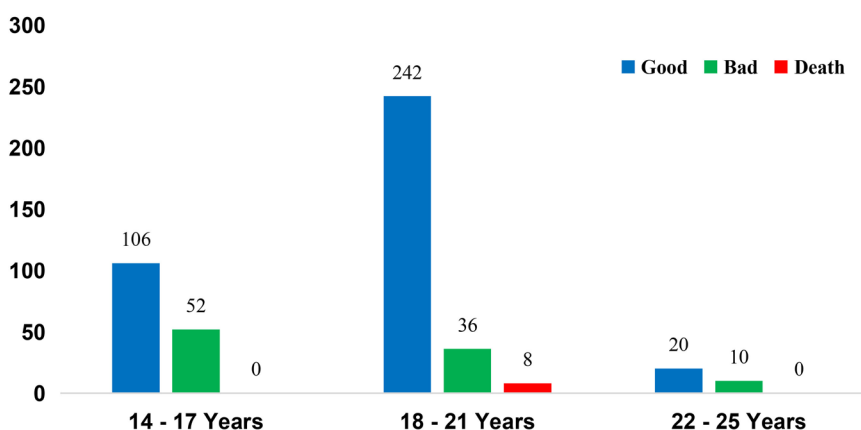
Figure 4. Maternal age and evolution of the newborn during the early neonatal period (n = 474); p-value = 0.4194.

4. Discussion

Primiparity remains an important period in every woman's obstetric experience. Primiparous mothers are a high-risk group during pregnancy and childbirth, as evidenced by several scientific studies [5] [7] [13] [18] [19]. Good control of the factors associated with this risk is necessary to significantly reduce morbidity and mortality.

In Moba, deliveries by primiparous women account for 17.9% of all hospital deliveries. Indeed, the frequency of women having their first experience of childbirth varies from one country to another.

In Lubumbashi (Democratic Republic of Congo), Munan *et al.* [7] reported 19.9% while Okunade *et al.* [20] in Lagos, Nigeria reported 15.3%. The results of these two studies are close to our findings regarding the frequency of primiparity. On the other hand, Danish *et al.* [21] found 27.3% of primiparous births; and Latif *et al.* [22] in Bangladesh (a developing country such as the Democratic Re-

public of Congo) there were 500 primiparous births out of 1250 births, or 40%. The difference in frequencies would be related to the birth reporting system, the study methodology and the behaviour of multiparous women. In fact, the latter tend to minimise the obstetrical risk of giving birth in hospital and most prefer to give birth at home. Several studies confirm this thesis and also evoke the fear of the primiparous as a result of their obstetrical inexperience, which in part obliges them to visit health services more frequently [7] [23] [24] [25].

The socio-demographic profile is dominated by primiparous women aged between 18 and 21 with an average age of 18.4 ± 1.9 years, married, educated up to secondary school level, and housewife. In fact, the age of first obstetric experience is closely linked to the sociological, cultural and economic environment. It is lower in rural than in urban areas because living conditions, easy access to modern contraceptive methods and high educational attainment tend to delay the age of marriage [26] [27] [28].

Under-age girls, under the age of 18, represent 33.3% of primiparous women, which should be of concern to political and health decision-makers. The protection of young girls in the fight against early marriages and sexual violence would help to reduce the high frequency of childbirths among girls under 18, given that 18.1% of primiparous girls were schoolchildren.

The majority of primiparas attended antenatal clinics, 98.3%. No woman had attended four antenatal consultations during pregnancy, which demonstrates poor management of pregnancies. Efforts still need to be made to improve the preventive care of high-risk pregnancies in general and particularly for this category of pregnant and parturient women [2] [7] [25].

In this series of studies, dystocic births represent 46.4% with predominance in the 14 to 17 age group, which bears witness to the young primiparas in our study series. Indeed, the rural environment is characterised by early marriages and unwanted pregnancies [1] [28] [29] [30], and Moba is no exception to this logic.

Eutocic deliveries account for 53.6% and mainly women up to the age of 18. And 92% of primiparous women gave birth by the vaginal route, caesarean sections cover only 8%. In view of these results, it appears that a non-negligible proportion of women had dynamic dystocia. These results corroborate those already mentioned in the medical and scientific literature [7] [16] [24].

Age was a significant determinant in the mode of childbirth, eutocic or dystocic. It is an obstetrical risk factor mentioned in several studies [2] [28] [29] [30], which should draw our attention and that of the political and health authorities to the need to combat early marriage and unwanted pregnancies.

The problem of the relationship between parity and obstetric complications is of interest to obstetricians. On the one hand, there are those who maintain that parity is a risk factor, and on the other hand there are obstetricians who limit the risks of complications related to parity. We are in harmony with the first group, as evidenced by several studies [7] [27] [28] [29] [30] and hospital obstetrical experiences, especially in developing countries.

The majority of primiparas and newborns had progressed well during the first

week, with 81.4% and 77.6% respectively. This is encouraging. However, the frequency of complications is worrying.

Among the complications encountered in primiparous births are delivery haemorrhages, puerperal infections, tearing of the perineum and tearing of the cervix. These have been mentioned by some authors and are closely related to dystocia [10] [22] [25].

This poor development, characterized by complications, was the cause of four deaths among primiparous women, *i.e.* 0.8%. This result testifies to the permanent risk to which the primiparous woman in rural areas is exposed, contrary to the main objective of modern obstetrics: "a woman cannot die as a result of her will to give life".

Among newborns, the morbid evolution was characterised by respiratory distress, anaemia and hypoglycaemia. These complications led to a mortality rate of 1.7%, or eight newborns. To combat this morbidity and mortality, well-equipped neonatal care services must be put in place.

In this study, the results show that the mode of delivery has a significant influence on maternal and neonatal mortality. On the other hand, the age of the primiparous does not determine mortality, which should draw our attention to the quality of care for primigravidae and primiparas in our environment. According to the World Health Organization, WHO, "approximately 15% of women develop a complication during pregnancy that requires the intervention of a qualified health care provider [31]". In our context, the public authorities should assign obstetricians to take care of women, from pregnancy to the return from childbirth. It is not normal that a population of more than 400 thousand inhabitants lacks specialists, especially in such a complex area as the management of maternal and child health.

Limitations of This Study

The limitations of this study lie in the lack of comparison with the control group, which can be multiparous. The data that constituted the results of this study were retrospective, which implies that certain parameters were not retained because they were not included in the partograms (in some cases poorly or incompletely filled in). It is therefore important that subsequent studies take these elements into account.

5. Conclusions

Maternal and neonatal mortality remains a public health problem, especially in developing countries such as the Democratic Republic of Congo. The main contribution and practical importance of this study are demonstrated by the results encountered.

In this series of studies, childbirth of primiparous women accounts for 17.9%. The majority are primiparous women aged between 15 and 24 years old with an average of 18.4 ± 1.9 years, post-primary level, married and housewives in the

home who have attended mostly ANC with an average of 1.7 ± 0.8 sessions. Childbirth of primiparous women in rural areas is characterized by dystocia (46.4%) and high risks of morbidity and mortality (maternal and neonatal). The results of this study make it possible to strengthen the fight against early marriages and sexual violence against minors, the adequate follow-up of pregnancies (especially those known as high-risk pregnancies) and the improvement of our capacities for the management and obstetric care of women.

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Conflicts of Interest

The authors do not declare any conflict of interest in relation to this study.

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