

Profile of delivering mothers in Lubumbashi, Democratic Republic of Congo

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Abstract

The aim of our study was to establish an inventory of deliveries in Lubumbashi, Democratic Republic of Congo. We carried out a descriptive study in 10 General Reference Hospitals in the city from 1 December 2013 to 31 May 2014. The study reports that pregnant mothers in Lubumbashi deliver at a mean age of 28.2 years. The women have a mean parity of 3.8, they are married (97.7%), overweight (mean BMI 25.68 kg / m²) and had 2.6 antenatal care on mean. The primary mode of delivery was spontaneous vaginal delivery (91.7%). About 10% of mothers had a complication dominated by perineal or vaginal tears and haemorrhagic complications. Newborns weighed on average 3121.2 grams and 0.56% had a congenital malformation dominated by polydactyly and cleft-palate. Maternal and perinatal mortality rates were 310 per 100,000 live births and 42.4 per 1,000 live births, respectively.

Key words: *Childbirth, Delivery, State of play, Lubumbashi.*

Profil des accouchées à Lubumbashi, République Démocratique du Congo

Résumé

Notre étude avait pour objectif d'établir un état des lieux de l'accouchement à Lubumbashi, République Démocratique du Congo. Nous avons mené une étude descriptive dans 10 maternités de référence de la ville du 1er décembre 2013 au 31 mai 2014. L'étude rapporte que l'accouchée à Lubumbashi est âgée en moyenne de 28,2 ans avec une parité moyenne de 3,8, mariée (97,7%), en surpoids (IMC moyen 25,68 kg/m²) et avait réalisé en moyenne 2,6 consultations prénatales. La voie basse était le principal mode d'accouchement (91,7%). Environ 10% des accouchées avaient présenté une complication dominée par les déchirures périnéales et vaginales et les complications hémorragiques. Les nouveau-nés pesaient en moyenne 3121,2 grammes et 0,56% d'entre eux présentaient une malformation congénitale dominée par la polydactylie et la fente labio-palatine. Les taux de mortalité maternelle et périnatale étaient respectivement de 310 pour 100000 naissances vivantes et de 42,4 pour 1000 naissances vivantes.

Mots-clés: *Accouchement, Etat des lieux, Lubumbashi.*

Introduction

Maternal and perinatal complications at birth are a daily concern for the obstetrician and neonatologist, especially in developing countries, which pay the highest price (99% of these maternal deaths); the main causes are haemorrhage, dystocia, hypertensive disorders of pregnancy and infections [1-4].

The Democratic Republic of Congo (DRC) is among the countries where the maternal mortality rate is still very

high, 846 per 100,000 live births according to the Survey Demographic and Health Survey published in 2014 [5]. The Demographic and Health Survey provides details of prenatal consultations to prevent risks and complications during pregnancy and childbirth and also highlights the wide disparities between provinces. The former province of Katanga, for example, with Lubumbashi as its headquarters, is among those with the lowest estimated antenatal attendance (79%) [5].

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In Lubumbashi (DRC), the largest study conducted at Sendwe Hospital between 2000 and 2011 reported genital haemorrhage as the leading cause of maternal death, affecting primiparous and large multiparous patients [6]. Another study on parturition in Lubumbashi reported in 2013 that perinatal mortality was 27% and the causes were mostly respiratory distress and neonatal infections [7].

To the best of our knowledge, no publication provides data on sociodemographic characteristics, obstetric environment and parameters related to maternal and perinatal morbidity and mortality for all maternity wards in the city of Lubumbashi. It is this gap that the present study intends to fill, thus giving a more or less exhaustive guide for further research aimed at reducing the burden of maternal and perinatal morbidity and mortality in the city of Lubumbashi in the Democratic Republic of the Congo.

Material and methods

This is a descriptive cross-sectional study carried out over the period between 1 December 2013 to 31 May 2014. During this study period, we recorded all births in the maternity wards of the 10 General Reference Hospitals (GRH) in Lubumbashi (Kamalondo GRH, Kisanga GRH, Kampemba GRH, Gecamines Sud Hospital, SNCC Hospital, Ruashi Military Hospital, University Clinics, Jason Sendwe Hospital, Katuba GRH, Kenya GRH). These hospitals are located in the 7 municipalities of the city of Lubumbashi. All women who attended these selected health facilities for delivery were included in the study regardless of where the pregnancy was being monitored. A total of 2,911 deliveries were recorded.

Staff at the survey sites collected information about maternal socio-demographic characteristics, obstetric environment and parameters related to maternal and perinatal morbidity and mortality. Interviews were conducted to obtain the patients' sociodemographic characteristics and obstetric history. An individual survey form had been prepared for this purpose and additional data were completed in the patient's obstetric file.

Variables studied were:

- Maternal sociodemographic characteristics: maternal age, parity, marital status, anthropometric parameters (height, weight and body mass index), history of caesarean section, and frequency of antenatal consultation (ANC). A pregnancy was not followed-up if there were no ANC, poorly followed if the number of ANC visits was less than 4 and followed well if the number of ANC visits was greater than or equal to 4).
- Parameters related to the obstetrical environment were mode of admission, gestational age, fetal presentation, type of pregnancy, type of pelvis, state of membranes and mode of delivery, episiotomy.

- Parameters related to maternal morbidity and mortality were maternal complications, blood transfusion and maternal outcomes. Anemia was defined on the basis of clinical signs and/or based on a hemoglobin level of less than 11 g/L, when available. Eclampsia was defined as an acute paroxysmal complication involving pregnancy-induced toxemia characterized by repeated seizures of sudden onset or succeeding a premonitory phase combined with neurological and digestive signs and can occur during pregnancy (most often during the third trimester, sometimes during childbirth or even within 48 hours after delivery).
- Parameters related to the newborn child were birth weight, sex, APGAR score, malformations and perinatal outcome.

The data was entered and processed using the Epi Info 2011 software (version 7.1). Analysis and interpretation used the calculations of proportion, mean and standard deviation.

The ethical clearance to carry out this work was granted by the Ethical Committee of the University of Lubumbashi. Free and informed consent from all involved in this study was obtained verbally.

Results

A total of 2,911 deliveries were recorded during the study period. Table 1 shows the sociodemographic characteristics of the mothers. 7.7% of the mothers were teenagers (<20 years) and 14.4% were over 35 years of age; the mean age was 28.2 ± 6.3 years. As for parity, 580 (19.92%) were first-time mothers and the mean parity was 3.8 ± 2.5 . 2.6% of the mothers were unmarried.

Table 1. Maternal sociodemographic characteristics

Variable	Frequency (n=2911)	Percentage
Age (years)		
<20	223	7.7
20-34	2268	77.9
≥35	420	14.4
Mean ± SD	28.2 ± 6.3	13 – 46
Parity		
1	580	19.9
2-4	1323	45.5
≥5	1008	34.6
Mean ± SD	3.8 ± 2.5	1 – 16
Marital status		
Single	76	2.6
Married	2835	97.4
History of cesarean section		
Yes	67	2.3
No	2844	97.7
Number of antenatal visits		
0	638	21.9
1-3	1451	49.9
≥4	822	28.2
Mean ± SD	2.6 ± 1.9	0 – 14

A history of caesarean section was present in 2.3% of mothers and 5.3% were transferred from another hospital center. The mean's number of ANC's was 2.6 ± 1.9 and 21.9% of women had no ANC.

Table 2. Maternal anthropometric parameters

Variable	Frequency (n=2430)	Percentage
Weight (Kg)		
<50	26	1.1
50-59	440	18.1
60-69	1070	44.0
70-79	600	24.7
≥80	294	12.1
Mean ± SD	67.78 ± 10.11	41 – 115
Height (cm)		
<150	45	1.9
150-159	751	30.9
160-169	1200	49.4
170-179	390	16.0
≥180	44	1.8
Mean ± SD	162.37 ± 7.10	140 – 189
BMI (kg/m²)		
<18.5	10	0.4
18.5-24.9	1110	45.2
25.0-29.9	1091	44.5
≥30.0	219	8.9
Mean ± SD	25.68 ± 3.27	16.7 – 43.8

For anthropometric parameters (Table 2), 8.8% were obese and 44.5% were overweight (mean BMI: 25.68 ± 3.27 kg/m²). 1.1% percent of the mothers weighed less than 50 kg (mean weight: 67.78 ± 10.11 kg) and nearly 2% were less than 150 cm (mean height: 162.37 ± 7.10 cm). The gestational age was available in only 1,936 of the deliveries. *Figure 1* shows that it was <37 weeks in almost 15% of cases and the mean was 39.06 ± 2.65 weeks.

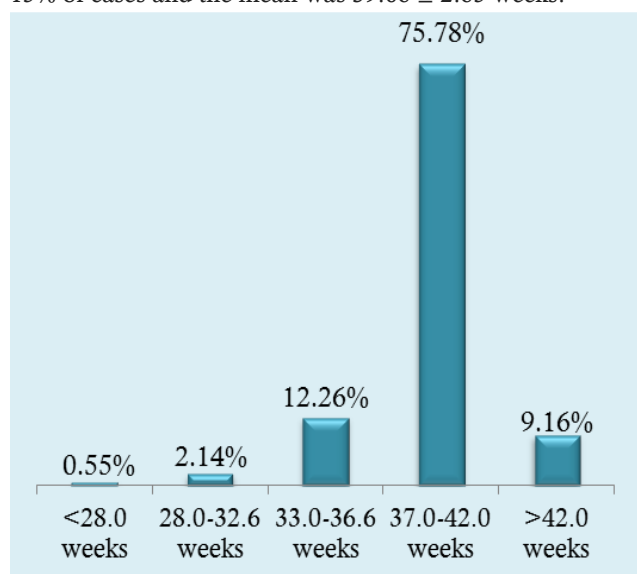


Figure 1: Gestational age (n=1936)

Parameters related to the obstetrical environment are presented in Table 3. Concerning the type of pregnancy, 3.2% of pregnancies were twins and 0.2% were triplets.

Table 3. Environnement obstétrical

Variable	Frequency (n=2911)	Percentage
Mode of admission		
Not-referred	2758	94.7
Referred	153	5.3
Pelvis		
Normal	2855	98.1
Retracted	33	1.1
Limit	22	0.7
Not assessed	1	0.03
Fetal membranes		
Intacts	2253	77.4
Ruptured	658	22.6
Type of gestation		
Monofetal	2813	96.6
Twin	93	3.2
Triplet	5	0.2
Mode of delivery		
Cesarean	243	8.3
Vaginal delivery	2668	91.7
Episiotomy		
Not done	2619	90.0
Done	292	10.0

The fetal presentation was peak cephalic in 94.39% of the cases followed by that of the seat in 3.98% (*Figure 2*). Fetal membranes at admission were broken in 22.6% of pregnancies. Caesarean section was performed in 8.3% of cases and episiotomy in 10%.

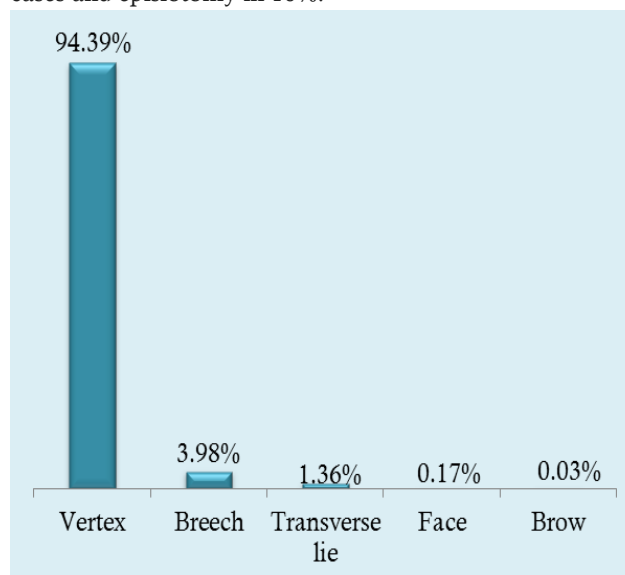


Figure 2: Type of presentation (n=3013)

Table 4 presents maternal morbidity and mortality. Maternal complications were dominated by perineal tears (3.19%), vaginal tears (2.06%) and haemorrhagic complications (1.82%). Twenty-nine women (1%) had been transfused. Maternal death was recorded in 0.31% of cases (9/2,911), representing a maternal mortality rate of 310 per 100,000 live births. The causes of death were haemo-

rrhage of delivery (55.6%), eclampsia (22.2%), amniotic embolism (11.1%) and uterine rupture (11.1%).

Table 4. Mothers' morbidity and mortality

Variable	Frequency (n=2911)	Percentage
Mothers' complications		
None	2623	90.11
Perineal tears	93	3.19
Vaginal tears	60	2.06
Haemorrhagic complications	53	1.82
Cervix tears	27	0.93
Retention of placenta	14	0.48
Rupture of the uterus	12	0.41
Eclampsia	10	0.34
Uterine atony	9	0.31
Endometritis	3	0.10
Abdominal walls' infection	2	0.07
Paraplegia	2	0.07
Amniotic emboli	1	0.03
Respiratory failure	1	0.03
Postpartum psychosis	1	0.03
Blood transfusion		
Yes	2882	99.00
No	29	1.00
Maternal outcome		
Alive	2902	99.69
Dead	9	0.31

As for neonatal parameters (Table 5), 9.86% of newborns weighed less than 2,500 grams and 5.57% had 4,000 grams or more. The male to female ratio was 1:1. Concerning congenital malformations, they were present in 17 newborns (0.56%), of which 41.17% polydactyly and 17.65% of labio-palatine clefts.

Table 5. Parameters related to the new-born

Variable	Frequency (n=3013)	Percentage
Birth weight (grams)		
<2500	297	9.86
2500-3999	2548	84.57
≥4000	168	5.57
Mean	3121.2±574.7	500 – 6400
Sex		
Female	1507	50.02
Male	1506	49.98
Congenital birth defects		
Absent	2996	99.44
Polydactyly	7	0.23
Cleft lip and or palate	3	0.10
Club-foot	2	0.07
Polymalformation	2	0.07
Anencephalia	1	0.03
Joint twins	1	0.03
Spina bifida	1	0.03
Outcome		
Dead	128	4.24
Alive	2885	95.76

We recorded 128 perinatal deaths, i.e. a perinatal mortality rate of 42.4 per 1,000 live births. 69.53% percent

of these deaths occurred in the antepartum period (figure 3).

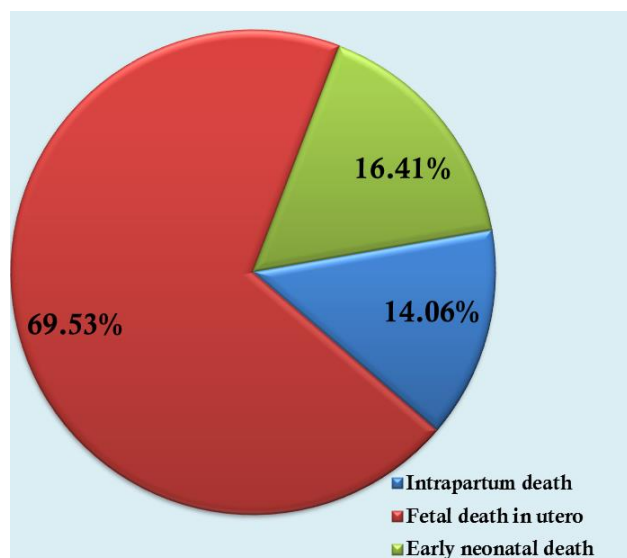


Figure 3 : Period in which death occurred (n=128)

Discussion

The study reports 7.7% of the women were adolescent girls. This rate is lower than that recorded by Tambwe *et al.* [8] at the University Clinics of Lubumbashi (DRC) in 1999, which was 13.9%. In African urban areas, the frequency of childbirth varies between 7% and 13% [9-11], while in rural areas it is more than 25% [12]. Poverty, illiteracy, and early marriages linked to cultural, ethnic and religious factors may explain this difference between the different environments. Thus, the education of the girl is promoted in the urban environment as opposed to the rural environment where it is not considered a priority and early marriages are encouraged [13].

In our study, 21.9% of women who gave birth had not received prenatal care. It is recognized that prenatal counseling has a role to play in reducing maternal mortality and perinatal mortality, especially as it is widely used by African women when it is available [14].

Caesarean section was performed in 8.3% of cases in our series. The frequency of caesarean section varies enormously from one country to another and within countries, from one medical institution to another [15,16]. In 2014, the Demographic and Health Survey in DRC reported that the average caesarean section rate was 5%, ranging from 4.1% in rural areas to 7.4% in urban areas [5]. According to the most recent estimates, the global mean caesarean section rate is 18.6%, ranging from 6.0% to 27.2% in the least developed and most developed regions, respectively [17].

This study finds a frequency of 3.98% of breech deliveries, more than 2.5% reported by Mukuku *et al.* [18] at the University Clinics of Lubumbashi. The frequency of presentation of the seat varies essentially according to the term of the pregnancy and is about 3 to 4% at term [19,20].

In this serie, 9.86% of newborns had weighed less than 2,500 grams. This rate varies by country, region and authors. According to estimates by WHO and UNICEF, the prevalence of low birth weight (LBW) is around an average of 7% in developed countries compared with 19% in developing countries [21]. Recently in Lubumbashi (DRC), Ilunga *et al.* [22] reported a LBW's frequency of 13%. The high frequencies in developing countries could be explained by the multiplicity of risk factors not found in developed countries including malnutrition, inadequate follow-up of pregnancy, malaria and repeated urogenital infections during pregnancy [23].

This study records 5.57% of newborns had weighed more than 4,000 grams (macrosomic deliveries). This frequency is close to 4.09% and 6.6% respectively reported by Iloki *et al.* [24] in Brazzaville (Republic of Congo) and Fuchs *et al.* [25] in France. Alternatively, it is higher than those previously reported in African studies, which found 1.57%, 2.1% and 2.4% respectively in Senegal, Burkina Faso and Kinshasa (DRC) [26-28]. Frequencies greater than 20% have been reported in Canada (24%) [29] and Denmark (28%) [30]. In the United States, this frequency was about 10% on mean [31]. The very low rates in previous African studies may be due to the presence of malnutrition, inadequate follow-up, poor hygiene during pregnancy and low socioeconomic status.

This study reports a maternal mortality rate of 310 per 100,000 live births. This rate is lower than that reported by the latest Demographic and Health Survey, which estimated it to be 846 deaths per 100,000 live births [5]. These figures are alarming even if they are only hospital numbers. There are significant intra-country disparities between low and high-income populations and between rural and urban populations. According to WHO, the maternal mortality rate in developing countries was 239 per 100,000 live births in 2015, compared with 12 per 100,000 live births in developed countries [32].

We recorded 128 perinatal deaths, a perinatal mortality rate of 42.4 per 1,000 live births and 83.59% of these deaths occurred during the antenatal period. Ntambue *et al.* [7], in 2010 in Lubumbashi (DRC), found a perinatal mortality lower than ours (27%).

Conclusion

This study reports that the average age at birth in Lubumbashi is 28.2 years with an average parity of 3.8,

married (97.7%), overweight (mean BMI 25.68 kg/m²) and average 2.6 prenatal consultations. The primary mode of delivery was the low-lying mode (91.7%). Approximately 10% of mothers had a complication and were dominated by perineal and vaginal tears and hemorrhagic complications. Newborns weighed a mean of 3,121.2 grams and 0.56% had a congenital malformation dominated by polydactyly and cleft palate. Maternal and perinatal mortality rates were 310 per 100,000 live births and 42.4 per 1,000 live births, respectively.

Competing interests

The authors do not declare any competing interests.

Author contributions

All authors participated in the design of the study, data acquisition, analysis and interpretation of results, in the review of the literature and editing of the manuscript.

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