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Risk Factors of Low Birth Weight in Mbujimayi City, Democratic Republic of Congo

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Abstract

The objective of this study was to identify and explain the factors influencing the birth of underweight children in the city of Mbuji-Mayi. Methods: This is not a paired case-control study of births registered from 1 to June 30, 2015 in maternity hospitals in three health zones selected for this study, cases are all children born with low weight and witnesses are all children born with a normal weight is 2500 g and more. The significance level was set at $p < 0.05$. Results: The proportion of LBW was 14.5%. The risk factors identified in this study are: Unmarried women [ORa = 2.92 (1.41 to 5.61)], not Luba Tribal origin [ORa = 1.71 (1.02 to 2.872)], anemia of pregnancy [ORa = 2.92 (1.79 to 4.75)], the non-attendance of the CPN [ORa = 1.92 (1.16 to 3.17)], preterm labor [ORa = 3, 11 (1.79 to 5.41)], diabetic mothers [ORa = 3.44 (1.91 to 6.21)], the history of malaria [ORa = 2 (1.23 to 3.26)], multiparity [ORa = 2 (1.23 to 3.26)] and threatened abortion histories [ORa = 6.17 (2.82 to 13.52)] had statistical significantly associated with links é FPN.

Subject Areas

Public Health

Keywords

Risk Factors, Low Weight, Mbujimayi

1. Introduction

The low birth weight (LBW) is a major public health problem both in developing countries than in developed countries. It is a major public health problem, both in developed countries than in developing countries, by its magnitude and its strong association with morbidity and mortality. In 2004, according to UNICEF estimates, over 20 million children are born with LBW in the world, accounting for 15.5% of all births; most of these low-weight births (96%) occur in developing countries. In these countries, the proportion of low birth weight (16%) is double that of developed countries [1].

The two main causes of underweight at birth are premature delivery (before 37 weeks of pregnancy are completed) and intrauterine growth restriction (IUGR) or a combination of both [2]. In developing countries where malnutrition is common, about 80% of underweight are due to growth retardation intrauterine largely due to maternal malnutrition [3]. In contrast, in developed countries, preterm birth is the leading cause of low birth weight, 70% of these children are premature [2].

Birth weight is an important indicator of the state of health and nutritional status of the mother before and during pregnancy. It is also an important predictor of child survival and further development [4]. There is a close association between short-term level of low birth weight, fetal and neonatal mortality and infant morbidity [4] [5].

Of the 11.6 million deaths of children under 5 in 1995 occurred in developing countries, 6.3 million (53%) were associated with low birth weight. In the medium term, the FPN is associated with cognitive and physical development of deficit reduction intellectual capacities of children [6].

These children are also prone to chronic and cardiovascular diseases related to diet in adulthood. Moreover, supported by the health system in developing countries children born with a growth deficit is generally insufficient or inadequate, due to its high cost. It then follows in significant consequences for companies in terms of loss of human capital and economic productivity. The causes and consequences of the low birth weight are complex and play an important role in the life cycle of the individual; the center of this cycle is the nutritional environment intrauterine important determinant of health status and subsequent growth of an individual [7].

The interdependence between the weight of children at birth and socio-economic and cultural conditions in which a population lives is evident. For many authors state that the incidence of low birth weight is due to several factors including the age of the woman in labor (less than 18 or greater than 35 years), infections, birth defects and undernourishment of the woman in labor which is the strong signal of low birthweight births [8].

To identify obstetric risk factors for low birth weight in Sahelian rural Patrick Kabore *et al* conducted a cross-sectional study in the north central Burkina and listed in 1013 newborns a single pregnancy to term. After adjustment for socioeconomic factors, primiparity (OR = 2.8), the vomiting of pregnancy (OR =

3.4), the execution of field work (OR = 3.3) and high workload during pregnancy (OR = 1.6) and home birth without assistance (OR = 2.1) were significantly associated factors in low birth weight even if the number of prenatal visits does not confer any advantage vis preventive vis the occurrence of underweight at birth [7].

Another case-control study was conducted in eight maternity hospitals in Ouagadougou from 30 March to 10 June 2005, to assess the importance of factors of nutrition and food origin associated with intrauterine growth restriction in Burkina Faso. In the univariate analysis, factors significantly associated risk in intrauterine growth restriction (IUGR) were maternal age < 20 years, maternal height, BMI (body mass index) before childbirth, weight gain weekly, BMI after childbirth, MUAC < 24 cm, the low score of dietary diversity, food shortages experienced by women, the number of antenatal < 3, the low status of women in society and the low socio At Multivariate analysis, the small size (OR = 2.13 (1.01 to 4.48)), the low MUAC (OR = 3.02 (1.78 - 5.12)) and consumption alcohol during pregnancy (OR = 2.89 (1.06 to 7.91)) remained significantly associated with IUGR [9].

A study in the Democratic Republic of semi-rural Congo Kamina who was on "Risk factors for low birth weight," it appears that 69 cases of newborn LBW deliveries are recorded on 483 or 14.3%. Factors associated with LBW determined in this work are maternal age below 18 years and above 35 years primiparity and not followed antenatal, prematurity, multiple pregnancies and female newborn [6].

Low birth weight is a multifactorial health problem whose prevention is possible through targeted interventions on modifiable factors that have proven effective in several countries. Thus, the rate of incidence of low birth weight is one of the perinatal health indicators recommended by WHO [10]. All the above shows clearly the importance of conducting studies of children coming into the world with a weight deficit not only on their prevalence but also and especially on risk factors for maternal and fetal origins. It is in this context that this study of risk factors for low birth weight in the city of Mbujimayi. The objective of this study is to identify and explain the factors influencing the birth of underweight children in the city of Mbuji-Mayi.

2. Material and Methods

A Framework: The present study was conducted in the Democratic Republic of Congo in the Kasai Oriental province/city Mbujimayi in 3 urban health zones which Dibindi, Diulu and KANSELE.

Type, period and study population: This is a case study—unpaired witnesses on the mother-child couples born during the period 1 to 30 June 2015. Criteria for inclusion and exclusion: were included in this study, all live births and their mothers. As exclusion criteria, every newborn from a multiple pregnancy, all newborn malformed, every newborn death in utero or newborn with a data collection sheet with incomplete data. The variables were extracted from moni-

toring records available to motherhood and the survey questionnaire. The main elements of this questionnaire were: demographics, economic and cultural of women, preventive characteristics of pregnancy, previous pregnancy characteristics, the characteristics of the monitoring of pregnancy and history of certain diseases during pregnancy. Sampling method: We examined and investigated all cases of mother-infant pairs admitted for delivery in maternity hospitals in all three health zones used in this study. It is a comprehensive study.

The variables of this study were: maternal age, marital status, level of "instruction, tribal origin, activity performed during pregnancy, number of people in the household, maternal weight, maternal height, gravidity, parity, history caesarean sections, Follow-up of prenatal consultations, history of diseases such as: hypertension, diabetes, malaria, anemia, genitourinary infections—urinary, threat premature delivery and threat of abortion.

Data collection and analysis: Data were collected using an interview guide questionnaire and the register of motherhood. Data were coded and entered using Excel 2008 version of the software, processed and analyzed using the software SPSS20. The khi2de Yatesa test was used. The oddsratio (OR) and its 95% confidence interval (95% CI) were calculated. The significance level was set at $p < 0.05$.

This study was approved by related ethics committee besides and mothers sign informed consent and have a whole understanding of this study. Our study had no binding character. Any information collected from mothers has been and will remain confidential. Similarly, the names of participants will remain confidential and will not be mentioned in the presentation of results or associated to results in any way whatsoever.

3. Results

Table 1 of this paper gives the results summarized sociodemographic characteristics of mothers and low birth weight. This is the age, marital status, educational level, tribal origin of the mother, the activities carried out and the household load. Examination of this table shows that a total of 183 births recorded in 1266 (14.5%) are for newborns with LBW and 1083 (85.5%) children born with normal weight. Regarding the different risk factors subject to our investigations, it appears that for LBW proportions are higher among mothers aged under 20 years (20.4%) for the same observation are unmarried mothers (25.3%). Regarding the educational level of the mothers, the proportions of children of small birth weight are higher among less educated mothers (22.1%) even notices for non native mothers Mbujimayi City (24.9%). The association links are established between the age of less than or equal to 20 years, unmarried, uneducated mothers, and not from the town of P-Mbujimayi because their value is greater than 5%.

The analysis results of this Table 2 shows us that among mothers of lower weight 60 Kg, there are large proportions of LBW (14.8%) for the gravidity and parity, children with low birthweight proportions birth are higher in first preg-

Table 1. Relationship between sociodemographic characteristics of mothers and low birth weight.

demographic and economic characteristics of women (n = 1266)	Low birth weight		OR [95%]	p
	Yes	no		
Age of mothers				
≤20 years	63 (20.4%)	246 (79.6%)	1.7 [1.27 to 2.50]	0.001
≥21 years old	120 (12.5%)	837 (87.5%)		
Civil status				
unmarried	25 (25.3%)	74 (74.7%)	2.16 [1.33 to 3.50]	0.001
Married	158 (13.5%)	1009 (86.5%)		
Level of education				
Low level	62 (22.1%)	218 (77.9%)	2.03 [1.44 to 2.85]	0.000
Superior	121 (12.3%)	865 (87.7%)		
tribal origin				
not Luba	65 (24.9%	196 (75.1%)	2.49 [1.77 to 3.50]	0.000
Luba	118 (11.7%)	887 (88.3%)		
Activity performed during pregnancy				
heavy work	148 (14.8%)	854 (85.2%)	1.13 [0.76 to 1.68]	0.534
light work	35 (13.3%)	229 (86.7%)		
Number of people in the household				
Less than 6 people	97 (15.5%)	527 (84.5%)	1.19 [0.86 to 1.62]	0.277
More than 6 people	86 (13.4%)	556 (86.6%)		

Table 2. Relationship between characteristics of the monitoring of pregnancy, previous pregnancies and low birth weight.

Characteristic related to pregnancy of women (n = 1266)	Low birth weight		OR [95% CI]	p
	Yes	No		
Weight mothers				
≤59 kg	83 (14.8%)	477 (85.2%)	1.05 [0.77 to 1.44]	0.741
≥60 kg	100 (14.2%)	606 (85.8%)		
Maternal height				
Less than 150 cm	35 (13.4%)	226 (86.6%)	0.90 [0.60 to 1.33]	0.600
More than 150 cm	148 (14.7%)	857 (85.3%)		
gravidity				
primigravidae	87 (29.1%)	212 (70.9%)	3.08 [2.25 to 4.22]	<0.001
multigravidae	116 (11.8%)	871 (88.2%)		
Parity				
primipare	71 (23.8%)	227 (76.2%)	2.39 [1.72 to 3.33]	<0.001
multiparous	112 (11.6%)	856 (88.4%)		
History of caesarean sections				
Yes	11 (13.3%)	72 (86.7%)	0.90 [0.47 to 1.73]	0.747
No	172 (14.5%)	1011 (85.5%)		
Follow-up of prenatal consultations				
No	39 (13.4%)	252 (86.6%)	0.89 [0.61 to 1.31]	0.561
Yes	144 (14.8%)	831 (85.2%)		

nancies and first-time mothers respectively (29.1%) and (23.8%). The finding is the association between primigravidae, primiparous and LBW.

On this Table 3, we identify the following observations: the proportion of children with low weight are elevated in diabetic mothers (31.6%), regarding the history of certain diseases of pregnancy, it emerges from these results that the proportions with low weight children are great for mothers with pregnancy history of anemia (23.8%), among mothers with a history of genitourinary infections (21.4%), those with threatened abortion (33.8%) and among those with preterm labor (55.1%). there is an association between some history of diseases during pregnancy and low birth weight is the case of diabetes, malaria on pregnancy, anemia of pregnancy, gynecological and urinary tract infections during pregnancy the threatened abortion and premature delivery.

The results of this Table 4, show that Multivariate analysis by logistic regression (stepping down), adjust on all variables, the FPN is influenced by the following factors: Age of mothers under 20 years old [ORa = 6.17 (2.82 to 13.52)], unmarried mothers [ORa = 2.92 (1.41 - 5.61)], do not originate in the

Table 3. Relationship between certain diseases during pregnancy and low birth weight.

Pathologies during pregnancy	Low birth weight		OR [95% CI]	P
	Yes	No		
HTA				
Yes	7 (22.6%)	24 (77.4%)	1.75 [0.74 to 4.13]	0.192
No	176 (14.2%)	1059 (85.8%)		
Diabetes				
Yes	6 (31.6%)	13 (68.4%)	2.79 [1.04 to 7.44]	0,032
No	177 (14.2%)	1070 (85.8%)		
Malaria				
Yes	104 (12.7%)	716 (87.3%)	0.67 [0.49 to 0.98]	0,015
No	79 (17.7%)	367 (82.3 %%)		
Anemia				
Yes	36 (23.8%)	115 (76.2%)	2.06 [1.36 to 3.11]	<0.001
No	147 (13.2%)	968 (86.8%)		
genitourinary infections				
Yes	56 (21.4%)	206 (78.6%)	1.88 [1.32 to 2.66]	0.0003
No	127 (12.7%)	877 (87.3%)		
preterm labor				
Yes	27 (55.1%)	22 (44.9%)	8.35 [4.64 to 15.02]	<0.001
No	156 (12.8%)	1061 (87.2%)		
Threatened abortion				
Yes	49 (33.8%)	96 (66.2%)	3.76 [2.55 to 5.54]	<0.001
No	134 (12.0%)	987 (88.0%)		

Table 4. Multivariate analysis by logistic regression was not-not upward explanatory parameters of low birth weight.

Factors explaining low birth weight	Coef.	ES	ORa and 95%	p
Age of mothers under 20 years	1.81	0.400	6.17 [2.82 to 13.52]	≤0.001
Unmarried mothers	1.07	0.332	2.92 [1.41 −5.61]	0.001
Low education	−0.67	0.333	0.88 [0.59 to 1.30]	0.841
Not originate in the city mothers	0.54	0.263	1.71 [1.02 to 2.872]	0.040
Anemia of pregnancy	1.07	0.249	2.92 [1.79 to 4.75]	≤0.001
Follow-up of prenatal consultations	0.69	0.255	1.92 [1.16 to 3.17]	0.010
Threatening preterm delivery	1.13	0.281	3.11 [1.79 to 5.41]	≤0.001
Women with diabetes	1.45	0.664	4.27 [1.16 to 15.71]	0.029
The history of malaria	1.23	0.301	3.44 [1.91 to 6.21]	≤0.000
The weight of the woman	−0.67	0.333	0.51 [0.26 to 0.98]	0.044
primiparous	0.69	0.249	2 [1.23 to 3.26]	0.005
The threatened abortion history	0.34	0.309	1.41 [0.77 - 0.26]	0.260

city mothers [ORa = 1.71 (1.02 to 2.872)], the pregnancy of anemia [ORa = 2.92 (1.79 to 4.75)], the non-tracking the CPN [ORa = 1.92 (1.16 to 3.17)], threatening preterm delivery [ORa = 3.11 (1.79 to 5.41)], diabetic women [ORa = 3.44 (1.91 to 6.21)], the history of malaria [ORa = 2 (1.23 to 3.26)], multiparous [ORa = 2 (1.23 to 3.26)] and threatened abortion histories [ORa = 6.17 (2.82 to 13.52)].

4. Discussion

The results showed that there is therefore a statistically significant association (p = 0.000) between maternal age (under 20) and the birth of a newborn of low birth weight. These results corroborate those of several other authors [11] [12]. Indeed teenage girls who have not yet completed their own growth, are more likely to deliver low birth weight children in comparison to older mothers have the same nutritional status [13]. This could be explained by competition for nutrients between the teenager growing and developing fetus as well as the low efficiency of placental function at this age [14]. More competition between pregnancy and growth has a particularly adverse effect on the status of micronutrient [15] adolescents. These teen mothers often have other factors that increase the risk of birth of children of low birth weight: black, low socioeconomic status, small size, low level of education, lack of or insufficient care prenatal health [16]. It seems increasingly clear that the age would be a social risk factor and not a biological factor, except among very young adolescents [17].

Our results showed that women not originating from the city of Mbujimayi run 1.7 times the risk of a child of small birth weight. This can be explained by the simple fact that the migration movement leaves some people under stress which causes a dysfunction in the female body that can lead to low birth weight in pregnant women in this condition (stress). The US and some custom in tribal

forbid women to consume meat in all forms and eggs, now these foods contain more protein and other nutritious elements of the body. Missed this intake during pregnancy leads to a general malnutrition which is a strong factor occurrence of children with less than 2500 g weight.

In connection with the monitoring of prenatal consultations, we found that pregnant did not follow ANC ran 1.9 times the risk of delivering newborn LBW. This observation is similar to that returned by other authors as Letaief million (2001) and Bwana in 2014 [11]. It could be explained by the fact that the lack of monitoring of pregnancy does not allow to act on the medical causes of treatable low birth weight or to monitor the results of systematic preventive measures against malaria, anemia or nutritional deficiencies. Such public health problems are common in the middle of our study and negatively impacts the weight growth of the fetus. Prenatal and postnatal are important for women of childbearing age, prenatal care can prevent many diseases that are underweight at birth (malaria, intestinal worms, anemia.), The supplementation of micronutrients (iron, acid folic, vitamin A) and education of pregnant women on healthy pregnancy. Follow-up of prenatal consultations easily leads to LBW.

On gender, our results demonstrated that multiparous women were at higher risk to a low birth weight. Our results contrast with those of Bwana in Kamina in 2014 which noted that the first-time run 2.48 times greater risk of low birth weight than multiparous. The risk in multiparous is justified by the fact that women in sub-Saharan Africa spend most of their life, or 35% to 50% of childbearing years, to meet the obligations of pregnancy, childbirth and breastfeeding, causing the maternal depletion syndrome. It is observed that the energy costs of pregnancy and more of lactation, particularly in the context of frequent reproductive cycles (that is to say, with little or no recovery interval where the woman is not pregnant or lactating), lead by an accumulation effect, degradation of maternal nutritional status, and can lead to low birth weight [6].

We also found a statistically significant association between a history of certain diseases such as: diabetes, malaria and anemia of pregnancy. For his part, TIETCHE F *et al* in 1998 révèlent that among the factors that are associated with PPN include genitourinary infections, fevers suspected malaria and anemia [16]. Mr. Kramer in 2000 shows that, history of threatened abortion, threatened abortion and diabetes and many other factors are risk factors of children with underweight. These malaria-history and anemia is justified by the simple fact that the City of Mbujimayi is an area where malaria is the more prevalent disease, a pregnant woman can at least done once or twice malaria on pregnancy [17].

5. Conclusion

After this study has established the relationship between maternal factors and low birth weight, has been shown that maternal age less than 20 years, the non tracking antenatal, multiparity, unmarried women, non Luba, on anemic pregnant with preterm birth, history of diabetes, malaria and threatened abortion were the factors associated with the occurrence of low birth weight in our study

environment. These factors are reversible and the initiation of an implementation plan suggestions and recommendations would master them, to reduce the risk of low birth weight and contribute to the reduction of infant mortality rate and that of distant complications due to this major public health problem. This could then help stakeholders in the field of health for all levels of the system to better understand the problems of underweight at birth and do more to benefit the health of mother and child.

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