



## **Prevalence and risks factors associated to low birth weight in a rural referral hospital, east democratic republic of Congo**

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### **Abstract**

**Background:** The world Health Organization WHO defines low birth weight LBW as a newborn having a weight of less than 2500 g at birth. WHO estimates that about 22 million LBW babies are born annually and they often face to short and long term health complications. The rate of LBW is important in, any developing countries as Democratic Republic of Congo. Our study aimed to estimate the prevalence of LBW and identify the risk factors associated to LBW at Rutshuru referral Hospital in neonatology unit.

**Methods:** We carried out an analytical sectional study from January, 1<sup>st</sup> to December 31, 2018. A total of 163 newborns with low birth weight less 2500 g was included in this study. Collected data were analyzed by using SPSS version 20.0. Odds ratio were calculated to determine the relationship between independent and dependent variables.

**Results:** The prevalence of LBW was 15.4%. Risk factors associated to the low birth weight was single marital status 8.84 [5.29-14.76], unemployed 12.15 [7.1 -20.8], maternal age  $\leq$  18 years 1.22 [0.78-1.91], low level education 17.1 [9.84-29.71], irregular antenatal care visit 2.85 [1.81-4.49] and low body mass index  $<$  18.5 Kg/ m<sup>2</sup> 5.8 [3.85-8.74].

**Conclusion:** This study demonstrated that low birth weight is major health problem in our study city.

**Keywords:** prevalence, low birth weight, rural hospital

### **Introduction**

Low birth weight (LWB), is a major public health problem both in developed countries and developing countries. It's strongly associated with high morbidity and mortality in neonatal period [1,3]. According World Health Organization (WHO), the prevalence of LWB is estimated between 15-20% of all births worldwide, representing a minimum of 22 million newborns annually around the world [4]. The vast majority of low birth weight are in the low resource countries and this trend has not changed in the last 10 years [5,7]. Low birth weight babies account for 60-80 % of all neonate's deaths [8,9]. Half of all low birth weight are born in South Central Asia 27 % and in Sub-Saharan Africa countries 15% [10]. Most of the babies in Sub-Saharan Africa are at risk of being born preterm with higher risk of death compared to full term babies [11]. In Democratic Republic of Congo, several studies conducted showed different prevalence of low birth weight, 14.5% in Mbuji-Mayi [1], Kamina [12] and Lubumbashi [13, 14]. In Rutshuru rural entity, Democratic Republic of Congo none study done. The present study aims to determine the prevalence of newborn with low birth weight and identify risks factors associated.

### **Material and Methods**

We conducted an analytic cross sectional study in neonatal unit of Rutshuru Referral Hospital, North Kivu Province in East

Democratic Republic of Congo from January 1<sup>st</sup> to December 31, 2018. The selection criteria in this study, were all newborns with low birth weight  $<$  2500 g during the fixed period. Low birth weight was defined as a newborn, having a weight less than 2500 g at birth, normal weight is 2500-4000 g and macrosomia as a newborn having more than 4000 g [15]. Newborns variables selected were: gestational age at birth, birth weight, newborn sex, Apgar score, delivery way and mother's variables were: marital status, maternal occupation, maternal age, level education, parity, prenatal visit and body mass index. Exclusion criteria were newborn with 2500 g or more. According WHO recommendations, Body mass index, were categorized in underweight  $<$  18,5kg/m<sup>2</sup> normal weight 18.5- 24.9 kg/ m<sup>2</sup> and overweight, obese  $\geq$  25 kg /m<sup>2</sup>. The collected data were entered, coded and analyzed by using the SPSS version 20.0. The degree of association between independent and dependent variables was the odd's ratio corresponding to 95% confidence intervals. Ethical approval for this study was obtained and confidential has been remain. Study limitations, being a retrospective study, we had no influence on the quality of data entered into the delivery registers. Some predictors of low birth weight such as use of creational drugs, smoking and alcohol consumption during pregnancy, genetic predisposition could not be assessed due to lack of data collected on these variable in our different registers. However, with the large size and statistical analysis controlling potential confounders.

**Findings****Table 1:** Newborns characteristic

Characteristic	N=163	100%
Gestational age(Weeks)		
<28	09	5.5
28-32	22	13.5
33-37	132	81.0
Birth weight(gram)		
<1000	10	6.1
1000-1500	22	13.5
1501-2449	131	80.4
<b>Sex</b>		
Male	69	42.3
Female	94	57.7
Apgar score		
<7	64	39.3
≥7	99	60.7
Delivery		
Dystocia	142	87.7
Cesarean	21	12.3

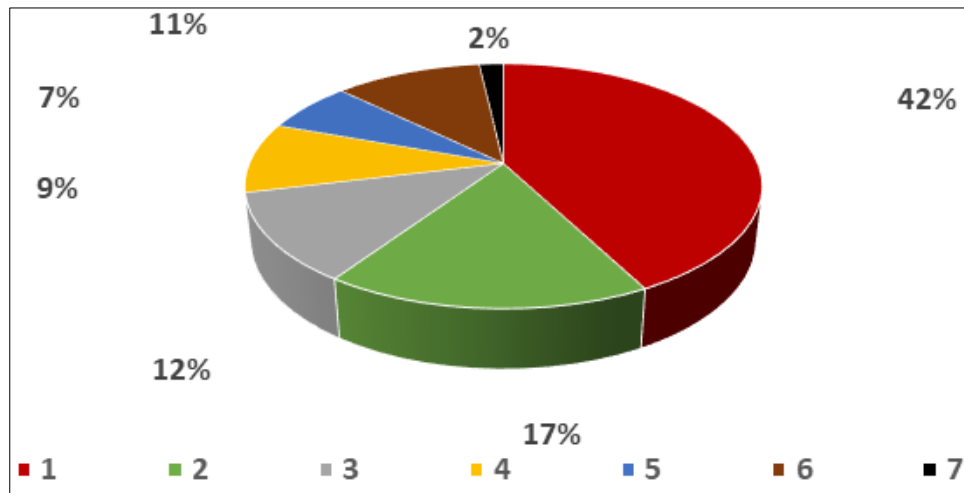
Majority of gestational age at birth was between 33-37 weeks in 80.4%, 57.7% of newborn was female, sex ratio was 0.73. 81.1%, Children born with low weight between 1501-2499 g was

**Table 2:** Risks factors associated to low birth weight

Risks factors	Case n=163(%)	Control group n=326(%)	OR IC 95%
Maternal status			
Single	69(42.3)	25(7.7)	8.84[5.29-14.76]
Married	94(57.7)	301(92.3)	
Maternal Occupation			
Unemployed	145(89.0)	130(39.9)	12.15[7.1-20.8]
Employed	18(11.0)	196(60.1)	
Maternal age(years)			
≤18	39(23.9)	67(20.6)	1.22[0.78-1.91]
>18	124(76.1)	259(79.4)	
Level education			
Low(Primary)	146(89.6)	109(33.4)	17.1[9.84-29.71]
High(Secondary or +)	17(10.4)	217(66.6)	
Parity			
Primiparous	48(29.4)	97(29.8)	0.99[0.66-1.49]
Multiparous	115(70.6)	229(70.2)	
Antenatal care visit			
< 4	52(31.9)	46(14.1)	2.85[1.81-4.49]
≥4	111(68.1)	280(89.9)	
BMI(Kg/m <sup>2</sup> )			
<18.5	104(63.8)	76(23.3)	5.8[3.85-8.74]
≥18.5	59(36.2)	250(76.7)	

It's appears from this table that single marital status, unemployed, maternal age ≤18 years, low level education, irregular antenatal

care visits and maternal low body mass index are major risks factors associated to low birth weight.



**Fig 1:** Maternal pathologies associated during pregnancy

In our series, malaria 42.3% and anemia 17.2% are important maternal diseases associated to pregnancy.

### Discussion

#### Prevalence of low birth weight

During our study period 889 newborns were admitted to neonatology unit, 163 of them had low birth weight less 2500 g representing 15.4% of prevalence. Similar results were noted in Senegal 16.1%, Kamina 14.3% and in Mbuji-Mayi 14.5 %. This prevalence is highest compared to Malawi prevalence 5.9 % lowest to Ghana prevalence 41.9% [16, 1, 12]. In our context, low birth weight could be explained by poverty, chronic maternal malnutrition influenced by multiplicity war and arm conflicts. This factors are caused of intrauterine growth restriction and prematurity.

#### Characteristics of newborn

Majority of newborns in this study was female 57.7% and sex ratio 0.73. Apgar score  $\leq 7$  was 39.3%. This result corroborates with Ntsama [20] and Kanyiki [1] findings respectively in Yaoundé and Mbuji-Mayi.

#### Risks factors associated to low birth weight

Growth of the body in utero is determined by maternal, fetal and placenta factors. In our study risks factors strongly associated with low birth weight are single marital status, unemployed, maternal age  $\leq 18$  years, low level education, irregular antenatal care visits  $<4$  and low body mass index  $< 18.5$  kg/m<sup>2</sup> with a significant association. Other studies reported similar risks factors [12, 14, 21, 24, 26]. Lack of antenatal care visit was reported as significantly associated with low birth weight. It's creates health awareness and timely identification of complication [10, 17, 18]. This could be because by poverty resulting of poor maternal nutrition status which contributes to the occurrence of low birth weight. In our series the sociodemographic and mother factors are insufficiently controlled. Baby's birth weight is related to birth weight of both parents and more strongly through the maternal line. Women born with low birth weight have higher risk of also having low birth weight babies. When these female babies enter

Motherhood they are at risk of having hypertension, diabetes and delivering babies with low birth weight.

The intergeneration transmission of birth weight and its delayed effects later in life are matter of concern [10]

#### Maternal pregnancies pathologies

In our study, malaria 42.3% and anemia 17.2% was important diseases noted during pregnancy women. Anemia is commonest medical disorder pregnancy in developing countries. Anemia mother tend to deliver small babies for age. There is strong relationship exists between maternal anemia and low birth weight babies. Several studies reported a significant higher incident of low birth weight babies among maternal anemia as compared to non-anemic mothers [25, 1]. Also, iron deficiency is the commonest cause of anemia in pregnancy in our study area due to poverty, malnutrition, multiparty and malaria. Iron supplementation during pregnancy is expected to reduce the risk of anemia and protecting the babies against low birth weight.

#### Conclusion

The prevalence of low birth weight in this study was 15.4% and was significantly associated to single marital status, unemployed, maternal age  $\leq 18$  years, low level education, antenatal care visit and low body mass index  $<18.5$  kg/m<sup>2</sup>. Action of maternal education, quality of antenatal care; screening and treatment of maternal diseases during pregnancy is necessary to reduce prevalence of low birth weight in our area study.

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#### Conflict of interest

Authors declares no conflict of interest

#### Author's contribution

Study conception and data collection: Rwakadingi Niyonzima J, data analysis, interpretation and discussion: Mashako Ruhanga M. and Mashako Katonda Y. All authors read, revised and approved final manuscript.

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