

Risk Factors of Low Birth Weight In Cotonou (Benin)

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ABSTRACT

Introduction: Low Birth Weight (LBW) is a major global health problem because of its magnitude and strong association with child morbidity and mortality. The objective of this study was to identify the risk factors for low birth weight in urban areas in Cotonou (Benin) in 2019.

Methods: This was a cross-sectional and analytical study conducted in an urban setting (Cotonou). It covered 571 mothers and their children born in the period from 01 January 2019 to 28 February 2019. The data was collected during the period from 02 June 2020 to 12 June 2020. The data analysis was carried out using Software R 3.6.0. A binary logistic regression was carried out. The significance threshold was p<0.05.

Results: The frequency of FPN was 17.16%. The associated factors were maternal age below 20 years (ORa=8.37 95% CI:{3.41-21.17}), prematurity (ORa=4.53 95% CI:{2.24-9.32}), the presence of maternal pathology (ORa= 28.35 95% CI:{3.41-21.17}):{13,28-64,72}), lack of antenatal care (ORa=7,07 95% CI:{2,22-23,74}), and finally multiple pregnancy (ORa=28,69 95% CI:{10,54-85,03}).

Conclusion: With the exception of the non-modifiable physiological determinants, many important determinants of LBW remain accessible. Well-targeted and coordinated education and awareness raising could have a positive impact on improving the rate of underweight births.

Keywords: Risk factors; Low birth weight; Cotonou

INTRODUCTION

Low bBirth Weight (LBW) remains a major public health problem in both developing and developed countries [1]. The World Health Organization (WHO) estimates that LBW babies account for 17% of all live births. This frequency varies between countries, ranging from 7% in developed countries [2] to 19% in developing countries. LBW is an important public health indicator because of the strong association between birth weight and infant mortality and morbidity, and the incidence rate of LBW is one of the perinatal health indicators recommended by the WHO [3].

In addition to this excess mortality, LBW has consequences for the physical and mental growth of the child [4]. The phenomenon is complex and many factors are involved. Proximal factors relate to the mother, including her age, parity, nutritional status, health status before and during pregnancy, and lifestyle [5]. Then come the intermediate factors, which include the environment in the broad sense (health, social) and all the care provided to the woman during pregnancy. Finally, there are the more distal factors, related to the woman's status in society, her level of education, the cultural context and the socio-economic situation [6].

Prevention is possible through targeted interventions on modifiable factors, which have proven to be effective in several countries around the world.

The aim of this study is to contribute to the improvement of the health of the mother-child couple and to the prevention of low birth weight babies in the urban environment of Cotonou.

MATERIAL AND METHODS

This was a cross-sectional and analytical observational study over a period from 01 January 2019 to 28 February 2019. The population of this study consisted of records of deliveries and children born during the period from 01 January 2019 to 28 February 2019 inclusive. All records of live-born children and their mothers were included. The dependent variable was low birth weight with modalities. A child with a birth weight of <2500g was classified as low birth weight. The independent variables were related to the mother, pregnancy

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Received: August 02, 2021; Accepted: August 14, 2021; Published: August 23, 2021

Citation: Aboubakar M, Obossou AAA, Tognifode VM, Eteka CAS, Gnonlonfoun DD, Bagnan-Tonato A, et al. (2021) Risk Factors of Low Birth Weight In Cotonou (Benin). Gynecol Obstet (Sunnyvale) 11:566.

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and sex of the newborns. Data tabulation and analysis was done using the statistical software R version 3. Qualitative variables were expressed as frequencies and percentages and quantitative variables as means \pm standard deviation. Frequencies were compared using the chi-square test. We then performed a logistic regression to determine the adjusted odds ratio. For the different associations, the significance threshold was 5% (p=0.05).

RESULTS

Incidence of LBW

A total of 98 new-borns out of 571 births had a low birth weight, i.e. 17.16% (CI 95%:{15.20-19.05}).

The socio-demographic and clinical data of the mothers and newborns are presented in Table 1.

In our study population, the average age was 29.14 ± 6.84 years. Most of them were over 20 years of age (90.72%) and poor in 42.21% of cases. The pregnancy was full term (>36 days) in 78.46% and monofetal in 94.05%. Women who attended antenatal consultations accounted for 53.59%.

The fetuses were female in (94.57%). Association of different characteristics with birth weight (Tables 2 and 3).

A vertical reading of Tables 2 and 3 shows that all independent variables were significantly associated with birth weight (p<0.05).

Table 4 shows the univariate and multivariate analysis of the occurrence of LBW.

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In multivariate analysis we constructed a model including maternal age, gestational age, maternal pathology, maternal parity,

Table 1: Maternal and newborn characteristics in urban Cotonou (N=571).

Modalities	Number	Frequency (%)
Age of mother (29,14 year	rs ± 6,84 years)	
Less than 20 years	53	10.35%
More than 20 years	518	90.72%
Gestational age		
<37 SA	123	21.54%
≥ 37 SA	448	78.46%
Maternal pathology		
yes	82	14.36%
No	489	85.64%
Parity		
Primiparous	193	33.80%
Pauciparous	241	42.21%
Multiparous	137	23.99%
New born gender		
Male	265	46.41%
Female	306	53.59%
Pregnancy follow-up		
yes	540	94.57%
No	31	05.43%
Type of pregnancy		
singleton	537	94.05%
Multiple	34	05.95%

Table 2: Distribution of birth weight according to maternal characteristics in urban Cotonou in Benin (N=571).

	New born LWB (Yes)	ew born LWB (Yes) New born LWB (No)		
				p-value
	n(%)	n(%)	OR	
Maternal age				
Less than 20 years	33 (62.33%)	20 (37.7%)	8.30	<0.000
More than 20 years	65 (12.5%)	453 (87.5%)		
Gestational age				
<37 WA	56 (45.5%)	67 (54.5%)	4.40	<0.000
≥ 37 WA	42 (09.4%)	406 (90.6%)		
Maternal Pathology				
Yes	58 (70.7%)	24 (08.2%)	27.25	<0.000
No	40 (08.2%)	449 (91.8%)		
Parity				
Primiparous	45 (23.3%)	148 (76.7%)	5.00	
Pauciparous (2 à3)	19 (07.9%)	222 (92.2%)	5.80	0.000
Multiparous (≥ 4)	34 (24.8%)	103 (75.2%)	6.30	
Pregnancy follow-up				
Yes	78 (14.4%)	462 (85.6%)	7.40	0.000
No	20 (64.5%)	11 (35.5%)		
Type of pregnancy				
singleton	76 (14.2%)	461 (64.7%)	27.04	0.000
multiple	22 (64.7%)	12 (35.3%)		
Total	98 (17.16%)	473(82.84%)		

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Table 3: Distribution of birth weight according to newborn characteristics in urban Cotonou in Benin (N=571).

	New born LWB (Oui) New born LWB (Non)		
	n(%)	n (%)	p-value
New born Gender			
Male	19 (7.2%)	246 (92.8%)	
Female	79 (25.8%)	227 (74.2%)	0.000
Total	98 (17.16%)	473(82.84%)	

Table 4: Results of logistic regressio	n analysis of factors associated	d with Low Birth Weight (LBW).
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	Univariate analysis		Multivariate a	nalysis	
	OR (IC95%)	p-value	OR a (IC95%)	p-value	
Maternel age					
less than 20 years	8.30 (3.20-19.30)	<0.000	8.37 (3.41-21.17)	0.000	
More than 20 years	1.00		1.00	0.000	
Gestational age					
<37 SA	4.40 (2.20-9.30)	<0.000	4.53 (2.24-9.32)	0.000	
≥ 37 SA	1.00		1.00	0.000	
	Mater	nal pathology			
Yes	27.25 (12.20-63.70)	<0.000	28.35 (13.28-64.72)	<0.000	
No	1.00		1.00	<0.000	
		Parity			
Primiparous	5.80 (2.40-17.30)	0	6.90 (2.81-18.35)	0.000	
Pauciparous	1.00		1.00		
Multiparous	6.30 (2.54-19.30)	0,000	6.97 (2.69-19.42)	0.000	
	Pregna	incy follow-up			
Yes	1.00		1.00		
No	7.40 (2.19-24.45)	0.000	7.07 (2.22-23.74)	0.001	
Type of pregnancy					
singleton	1.00		1.00		
Multiple	27.04 (10.20-80.01)	0.000	28.69 (10.54-85.03)]	0.000	
	New	born gender			
Male	1.00				
Female	1.95 (0.80-4.95)	0.000			

consultation follow-up, pregnancy type and sex of the newborn from logistic regression analysis. The results showed that only the sex of the newborn was not significantly associated with Low Birth Weight (LBW).

DISCUSSION

In this study, 98 out of 571 registered newborns were LBW, i.e. 17.16% (CI95%:{15.20-19.05}). Akpovi et al in Cotonou in 1998 found a frequency of 21.18% [7]. The average age of the mothers was 29.14 ± 6.84 years.

Maternal age

Women under 20 years of age had a higher risk of delivering children with LBW than those over 20 years of age. (ORa=8.37 95% CI:{3.41-21.17}). The association between maternal age under 20 years and delivery of a low birth weight infant was statistically significant (p=0.000). Several other authors have also found this to be true [8,9]. Adolescent girls, who have not yet completed their own growth, are more likely to deliver low birth weight babies compared to older mothers with the same nutritional status [10]. This could be explained by the competition for nutrients between the growing adolescent and the fetus and the low efficiency of placental functions at this age [11]. This competition between pregnancy and growth has a particularly adverse effect on the micronutrient status of adolescents [12].

Gestational age

Concerning gestational age, we noted that in 45.5% of cases, pregnancies of less than 37 weeks of amenorrhoea resulted in low birth weight babies (p=0.000). After 37 weeks' amenorrhoea, LBWs accounted for only 9.4% of cases. The risk of delivering an LBW baby before 37 weeks' gestation was increased 4.53 times (ORa=4.53 95% CI:{2.24-9.32}). Our results are comparable to those in the literature [8,13]. The length of gestation is a determining factor for low birth weight. Indeed, the fetus gains a large part of its weight in the last weeks of pregnancy. Thus, children born prematurely, i.e. before the 37th week of gestation, are deprived of this weight gain and generally have a lower birth weight [14,15].

Maternal conditions

Certain medical conditions, such as hypertension and diabetes, can occur during pregnancy and are known to influence intrauterine growth and/or length of gestation. The presence of pathology in

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the pregnant woman predisposed to LBW (70.7%) with p<0.000. The risk was 28.35 (ORa=28.35 95% CI:{13.28-64.72}). This finding is consistent with that reported by other researchers [16].

Parity

Primiparous and multiparous women had a higher risk of giving birth to LBW than pauciparous women. Primiparity and multiparity have also been identified as predisposing factors for LBW by several authors [8,13]. This high risk in primiparous women (ORa=6.90 95% CI:{2.81-18.35}) could be explained by the high proportion of adolescent (i.e. growing) women among primiparous women. In multiparous women (ORa=6.97 95% CI:{2.69-19.42}) the maternal exhaustion syndrome, which is the consequence of the sometimes close pregnancies, delivery and breastfeeding, could justify the increased risk [17].

Pregnancy monitoring

Pregnant women who did not follow ANC were predisposed to deliver LBW babies (ORa=7.07 95% CI:{2.22-23.74}) as has also been reported by other authors [8,13]. Poor pregnancy follow-up does not allow action to be taken on the curable medical causes of low birth weight (malaria), to introduce systematic preventive or supplementation measures (anaemia or nutritional deficiencies) or to assess their effectiveness.

Type of pregnancy

We noted that 64.7% of multiple deliveries resulted in low birth weight infants compared to only 14.2% of single fetal pregnancies (ORa=28.69 95% CI:{10,54-85,03}), (p=0,000). According to the literature, twin or multiple pregnancies are at risk of low birth weight babies [18]. In fact, these women are more prone to hypertension and anaemia [19]. In addition, uterine overdistension caused by multiple pregnancies is the most common cause of preterm delivery.

CONCLUSION

This study shows that, apart from the non-modifiable physiological determinants, many important determinants of LBW remain accessible. Well-targeted and coordinated education and awareness-raising actions could have a positive impact on improving the rate of underweight births.

SOURCE OF FUNDING

Nil.

CONFLICT OF INTEREST

Nil.

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