Prevalence of Low Birth Weight and Associated Factor among neonate Born at Jimma Medical Center (JMC), Jimma, South Western Ethiopia

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Abstract

Background: Low Birth Weight continues to remain key public health concern related to poverty, social factors such as lower status of women, lack of nutrition and Antenatal care.

Objective: To determine the prevalence of Low Birth Weight and associated factor, among the neonates born in Jimma medical center from May 1, 2015 GC- April 30, 2017 G.C.

Methods: A facility based cross sectional descriptive study was carried out on birth weight distribution. Data was collected from delivery registration book of obstetrics department by using structured data collection format and analysis was done manually. Finally the finding was presented by using tables, frequency, percentage, x2-test was used to determine association between variables.

Results: A total of 3546 live birth new-born were observed among which more than half 54% were male and 46% were female. The mean birth weight was 3200 g and the prevalence of low birth weight was 7.8%. with regard to factor associated with birth weight Antenatal care follow up, parity, gestational age, sex of new born and maternal age during the last pregnancy had significant association with low birth weight with the p value <0.05.

Conclusion: The prevalence of low birth weight in the study area was comparatively lower than that of countrywide figure. Maternal related factors like, maternal age, parity, and Antenatal care follow up as well as new-born related factors like sex of the neonate and gestational age were significantly associated with low birth weight. Therefore Further Large scale study with a representative sample size is recommended to be conducted in the future..

Keywords: Birth weight; Neonate; New-born; Factor; Ethiopia

Introduction

Birth weight is the first weight of the new born obtained immediately after birth with in the first hour of life before significant weight loss occurred after birth [1]. World Health Organization (WHO) classified birth weight as macrosomia, normal birth weight (NBW) and low birth weight (LBW). Low birth weight is defined as having a birth weight of less than 2500 g regardless of gestational age and is further classified as very low birth weight (VLBW), a new-born birth weight less than 1500 g and extremely low birth weight (ELBW) is a neonate having birth weight less than 1000 g at birth regardless gestational age [2]. Globally over the last twenty years the world made extensive progress in reducing mortality among less than 28 days aged children. Despite progress over the past two decades, in 2017 alone, 2.5 millions of neonates died, due to low birth weight, prematurity and other preventable causes of neonatal death [3]. Child who have Low birth weight children have immature immune function are also prone to have increased risk of disease, lower IQ and cognitive disabilities which could affect their performance in school, job opportunities as adults and may develop chronic illness like diabetes and coronary heart disease in adult hood

[4,5]. Low Birth Weight of is also known to cause cerebral palsy more frequent hospitalization for all illness, more hearing and visual disability more behavioural disorders [1,2,6-10]. The global, approximately 20 million LBW infants born each year, 96.5 percent of them in developing countries and the prevalence of LBW is 15.5 percent. Half of all low birth weight babies are born in South-central Asia where 27 percent are below 2500 g at birth while LBW levels in sub-Saharan Africa are estimated at 15 percent [11]. According to WHO report, birth weight of an infant is dependent on amount of growth during pregnancy and the gestational age, and these factors are also related to the genetic makeup of the infant and the mother, her lifestyle and her status of health [12]. The weight of an infant at birth is an important milestone and also recognized not only as a reliable index of intrauterine growth but also as pertinent determinant of the probability of infant survival [6,10]. However, in Ethiopia reliable data on factors associated with birth weight are limited to few studies. The researcher believes that the scarcity of available data on this topic in the study area has limited the development intervention strategies and preventive measures towards low birth weights. Therefore this study was aimed to assess the prevalence and factors associated with low birth weight among the neonate delivered at Jimma medical center.

Materials and Methods

Study area

The study was conducted in Jimma medical center (JMC) which is found in Jimma Town, Jimma Zone, Oromia Region, and South-Western Ethiopia. Jimma Town has 346 Km from the capital city of Addis Ababa. Jimma medical center which serves as a referral hospital for zonal hospitals and health centers in the zones has different departments among these obstetrics departments is the one under which delivery service is given. As per JMC statistics, the center is currently providing different services for approximately 18 million people in the catchment areas. Maternity services are one of the wards with highest patient flow. Last year, the total number of live births was 3,976, among which 3,504 were live term births and the other 472 live Preterm births.

Study design and period

A two years retrospective cross sectional study was conducted from May 1, 2015 G.C. to April 30, 2017 G.C.
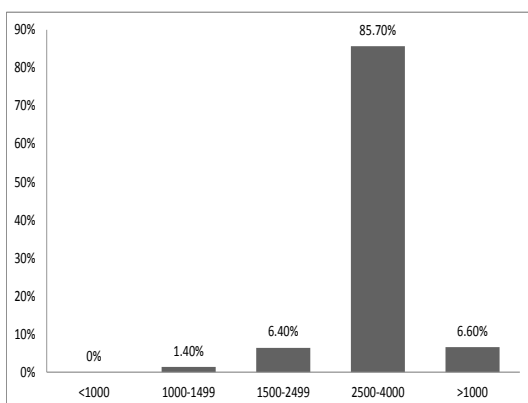

Figure 1 Birth weight distribution of all singleton live births who were delivered in Jimma hospital during the study period.

Sample size determination

No sample was drawn and all singleton live births in the study period were included

Data collection instrument and procedure

Data were extracted by reviewing delivery registration book of Jimma medical center and card of the study subject using a structured checklist adapted from previous related study [13]. The quality of the data collected was guaranteed by pretesting being done on 5% new-borns medical records before actual data collection, and essential modifications then being made. The data was collected by diploma nurses after the training was given for them on how to collect on how to collect data from the records to augment data accuracy and validity. There was close supervision of data collectors by the investigators.

Data analysis

The Collected data were, cleaned, coded and entered into Epi data 3.1 entered and exported, to SPSS for windows version 23.0 for cleaning and analyses, data were summarized, by using simple frequency tables, graphs and charts. x^2-test was done to, to determine the association between dependent and independent variables. Statically significant association was declared at p-value of 0.05

Results

A total of 3546 singleton live births neonate were delivered at JMC during the period between May 1, 2015 G.C to April 30, 2017 G.C. Among these 1918 were male and 1628 were females. The overall mean birth weight was 3200 g. The mean birth weight of male and female 3221 g and 3175 g respectively which showed that male was 46 g higher than that of the females. Of the total 3546 singleton live births 8% had less than 2500 g birth weight and 85.7% were between 2500 g and 4000 g while 6.6% had greater than 4000 g birth weight (**Figure 1**). Proportion of new-born birth weight among all singleton live births.

Association between Birth weight and Sex of the new-born's

From normal birth weight more than half 1648 (54.2%) of them were male and of the total Low birth weight new-born's majority 134 (59.2%) were females. Regarding Very Low Birth Weight (VLBW) majority 32 (66.6%) of them were females. This finding showed that sex was found to be significantly associated with the birth weight (**Table 1**).

Distribution of Socio-demographic characteristic of the mother by birth weight of their Neonates

Out of those mother who gave birth of <2500 g new-born majority 83 (30.3%) of them were aged between 20-24 years and followed by those mother aged between 25-29 which accounted 72 (26.3%). Regarding maternal residence out of the total mothers nearly half 1700 (47.2%) of them live in urban setting while 1846 (52.1%) live in the rural area and the prevalence of low birth weight was higher among the new-born delivered to rural mothers 8.6%. Maternal age and residence is found to

Table 1 New-born by birth weight and sex Association in JMC from May 1, 2015-april 30, 2017 G.C.

Birth weight	Male No (%)	Female No (%)	Total No (%)	X² test	p-value
Macrosomia	142 (61.2)	90 (38.7)	232 (6.6)		
Normal birth weight	1648 (54.2)	1392 (45.7)	3040 (85.7)		
Low birth weight	92 (40.7)	134 (59.2)	226 (6.4)	28.9 Df=3	0
Very low birth weight	16 (33.3)	32 (66.6)	48 (1.4)		
Total	1898 (53.5)	1648 (46.5)	3546 (100)		

Table 2 Socio-demographic characteristic of the mother by the birth weight of new born at Jimma hospital from May 1, 2015- April 30, 2017 Socio-demographic characteristics.

Variables	<2500 g No (%)	>2500 g No (%)	Total No (%)	X² test	p-value
Mother age (Year)					
<20	68 (20.85)	258 (79.1)	326 (9.19)		
20-24	83 (6.52)	1191 (93.48)	1274 (35)		
25-29	72 (5.86)	1156 (94.13)	1228 (34.63)	88.8 df=4	Pv=0.000
30-34	30 (6.4)	438 (93.58)	468 (13.19)		
>35	21 (8.4)	229 (91.6)	250 (7.05)		
Total	274 (7.72)	3272 (92.27)	3546 (100)		
Maternal residence					
Urban	115 (6.76)	1585 (93.23)	1700 (47.94)		
Rural	159 (8.6)	1687 (91.38)	1846 (52.05)	4.24 df=1	0.039
Total	274 (7.742)	3272 (92.27)	3546 (100)		
Parity					
1	131 (7.11)	1709 (92.88)	1840 (51.88)		
2-4	93 (6.65)	1305 (93.34)	1398 (39.42)	34.5 df=2	0
>5	50 (16.23)	258 (83.76)	308 (8.68)		
Total	274 (7.72)	3272 (92.27)	3546 (100)		
ANC follow up					
Yes	139 (7.76)	1651 (92.23)	1790 (50.40)		
No	135 (7.68)	1621 (93.31)	1756 (49.56)	0.00745 df=1	0.031
Total	274 (7.72)	3272 (92.27)	3546 (100)		
Gestational age					
< 37 weeks	62 (67.39)	30 (32.6)	92 (2.59)		
37-42 weeks	203 (6.03)	3137 (93.92)	3340 (94.19)	472 df =2	0
>42 weeks	9 (7.89)	105 (92.1)	114 (3.21)		
Total	274 (7.72)	3272 (92.27	3546 (100)		
Obstetric illness					
Yes	32 (32.65)	66 (67.34)	98 (2.76)		
No	242 (7.02)	3206 (92.98)	3448 (97.23)	87.8 df =1	0
Total	274 (7.72)	3272 (92.27)	3546 (100)		

be significantly associated with birth weight of the new-born's **(Table 2)**.

Discussion

This study gives an insight to prevalence of Low birth weight and associated factors among the new-born delivered in JMC, Jimma town, south west Ethiopia. The prevalence of Low Birth Weight (LBW) among the new-born delivered in JUMC was 7.8percent. This finding is inconsistent with that of the national figure which is 16% [1,5,9]. This difference might be due to the difference in sample size, study setting, delivery site, and types of health facilities, as this study is carried out only among the neonate delivered in one center located in Jimma town, while the study at national levels included the neonate delivered in multicentre and multiple region. Another possible reason for lower prevalence of low birth weight in our study area could be due to unreported home deliveries. This is evidenced by most labor of low birth weight is not difficult as compared to normal birth weight neonates. This study showed that sex of the new born has significant association with birth weight of the new-born's and also in this study males were 49 g heavier than females. This finding was consistent with the other similar study [13]. Usually boys have lower births weights compared to girls in every society which is also true in this study [3]. This review also revealed that the age of the mother was significantly associated (p<0.05) with low birth weight). The available literature also support teenagers mother and those mother below thirty five years have higher rate of low birth weight than in their 20's, and early 30's [10]. This study also revealed that maternal parity was significantly associated (p<0.05) with low birth weight. Similar to this finding the other study also showed that parity has a modest effect on birth weight [10]. The present study also showed that ANC and obstetric illnesses during the current pregnancy were associated with low birth weight. Neonates whose mother had not attended ANC follow up had higher prevalence of low birth weight (7.76%) as compared to neonate whose mother had ANC follow up (7.68%). The possible explanation is that mother who had more ANC follow up have their obstetric problem detected and treated or referred earlier [3]. In this study gestational age of the mother has significant association with low birth weight (p<0.01). Theoretically the shorter the gestation (the preterm births): The smaller is the baby and higher the risk of healthy and these findings are consistent with the study done in Jimma [3].

Conclusion

In conclusion, the prevalence of low birth weight in the study area was relatively lower than that of national figure. However this figure should not neglected as it is strong indicators of the health status of the community. This study showed sex of the new born, parity, maternal residence, obstetric illness, during the current pregnancy and maternal age, ANC follow up and gestational age were found to have statistically significant effect on LBW. Maternal and child health service such as ANC follow up service should be strengthened, so that the preventable and treatable case of LBW would be identified and treated earlier. Furthermore large scale research either hospital or community based must be carried out to get the clear picture of the problem and its risk factors for an appropriate design of intervention to reduce the magnitude of LBW in the study area [14-19].

Ethical Considerations

Ethical clearance to conduct the study was obtained from the

institutional review board of the Institute of Health, faculty of Health Sciences, Jimma University. Further permission was obtained from the medical director of JMC and the department head of paediatrics and gynaecology for the utilization of medical records. We guaranteed confidentiality by excluding names or any other personal identifiers from data-collection sheets and reports. The identifier for each eligible subject was replaced by a code, and no master code exists that allows the research data to be linked with the identifiers.

Conflict of Interest

Authors declared that they had no conflict of interest.

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