ORIGINAL ARTICLE

Prevalence and Determinants of Low Birth Weight in Sirte City of Libya

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Abstract

This study was undertaken to find out the prevalence and determinants of Low birth weight neonates in Sirte city of Libya. This was a crossectional study including 269 newborn babies delivered in Ibnsena hospital, (which caters the Sirte city for deliveries). The study was conducted in the first fortnight of January 2011. Out of 269 neonates 11 were VLBW < 1.5kgs 74 were with low birth weight (1.5 kg to 2.5 kg). The mean weight, standard deviation, standard error and variance was 2.63, 0.59, 0.036 and 0.35 respectively. Association of mothers age with birth weight was insignificant $p > .05$; but highly significant with hypertension , $p < .01$ at 99% CI . Similarly association of LBW with different variable of mother like anemia, smoking, life style, birth spacing, BMI, parity ,and toxemia of pregnancy was in between significant and highly significant ($p < .05$ to$< .01$ at 95/99 % CI at respective DF's. The variables of LBW are addressable to reduce this menace in developing and under developed countries.

Key Words

Prevalence, LBW, Neonates, Crossectional Study, Pregnancy

Introduction

Low birth weight (LBW), defined as a birth weight <2500 g, remains a significant public health problem in many parts of the world and is associated with a range of both short- and long-term adverse consequences (1). The latest regional estimates of LBW range from 25% in South Asia, where more than one-half of the world's LBW infants are born, to 10% and 12% in Sub-Saharan Africa and Latin America, respectively (2). Premature birth: Babies born before 37 completed weeks of pregnancy are called premature. About 67 percent of low-birth weight babies are premature in developed countries (3). Fetal growth restriction: These babies are called growth-restricted, small-for-gestational age or small-for-date. These babies may be full term or pre-term but they are under-weight according to the period of their gestation, Factors that may contribute to premature birth and/or fetal growth restriction include: Birth defects (4), chronic health problem in the mother, like hypertension (5) , Smoking (6); Alcohol and illicit drugs; Infection of mother and uterus like TORCHES; Placental problems, Inadequate maternal weight gain etc. (7).Women under 17 and over 35 years are also risk group for delivering LBW babies (8). The data regarding LBW in developing countries is awfully deficient and unreliable as even in today's date about 80% of deliveries are conducted in homes, present study concludes that most of the determinants of LBW are modifiable at affordable resources. Their adrressal can reduce prevalence of LBW. The study was conducted in Ibn-Sena hospital in Sirte,a Mediterranean coastal city of Libya, It is a crossectional study. All deliveries conducted in the Ibn-Sena hospital during first fort-night of 2011(1-14 January 2011) were included. The population of Sirte city is 192,762 according to latest census. All the babies were weighed without clothes within 1st hour of birth by baby weighing spring scales, standardized with accepted error of 100 gm (9). Low birth was designated if birth weight was less than 2500g (up to and including 2499g). Data was collected by interns posted in the department of Family & community medicine during the present study period. After delivery, the information regarding variables under study was collected using pretested, semi-structured, open ended questionnaire was used for the purpose. LMP of the mother was ascertained diligently to know pre-maturity. If mother cannot correctly remember the date, help from ultrasonography taken before delivery as for as possible. Collected data was summarized , coded and analyzed using SPSS version 17. For qualitative data Chi-square test was used to find out the relationship of LBW with anemia, hypertension,

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Table Ia. Association of Variables Under Study with Birth Weights of Study Group

	Grouped BW							
	<1.5kg	1.5-2.4 kg	2.5-2.9 kg	3-3.4KG	3.5--3.9 kg	4 kg and above	Total	Significance
1.Sex of baby male	6	39	72	17	6	7	147	P=.873,df 8 , at 95%CI not significant
female	5	35	57	17	2	6	122	
Total	11	74	129	34	8	13	269	
2. Mother's age <20	0	2	3	2	0	0	7	Pearson Chi-Square
20-29	9	38	65	18	4	8	142	Value1 0.633[a]
30-39	1	30	57	12	3	4	107	P= .778
>40	1	4	4	2	1	1	13	d f 15, not significant
Total	1	74	129	34	8	13	269	
3. Blood pressure: Normal	3	29	78	16	4	9	139	Pearson Chi-Square
High normal	1	16	36	12	4	0	69	Value 48.784[a]
Mild HT	1	3	6	0	0	1	11	df 20
Moderate HT	3	17	5	3	0	2	30	P=.0001
Severe HT	3	9	4	3	0	1	20	Highly significant, At 99% CI
Total	11	74	129	34	8	13	269	
4. Anemia Mild anemia	3	25	38	14	3	5	88	
No anaemia	6	31	85	20	4	8	154	Pearson Chi-Square
moderate	1	12	5	0	1	0	19	Value 32.377[a]
Severe	1	6	1	0	0	0	8	df 15
Total	11	74	129	34	8	13	269	P=.006 Highly significant
5.Smoking								
Smoker	1	9	4	0	0	0	14	Pearson Chi-Square
Nonsmoker	10	65	125	34	8	13	255	Value 11.775 P=.038, df 5
Total	11	75	129	34	8	13	269	Significant, at 95%CI

smoking, parity, socio-economic status and other important variables pertaining to mother. ANOVA test was used for calculating standard error of difference of mean birth weights in relation to smoking, hypertension, BMI and toxaemia of pregnancy. The significance of P value was calculated at 95% or 99% confidence interval at the respective df. P value >0.05 was considered insignificant, < 0.05 as significant and < 0.01 as highly significant and so on.

Results (*Table 1a &b, 2*)

Out of the 269 births , 11 and 74 were VLBW and LBW respectively, with prevalence 4.08 and 27.50 respectively. The range between minimum and maximum birth weights was 2.7kg, mean birth weight 2.63 kg, median weight 2.5 kg, SD 0.592, SE 0.036,interquartile range 0.30, skewness .552 and qutosis.793. Male v/ s female ratio of new born was 147:122 , but the association of LBW in both the sexes is not significant, p>.05 at 95 % CI with df 5. Similarly mothers' age and LBW were not significantly associated p.778 at df 15 at 68 % CI. Association of hypertension with birth weight was highly significant, p <.01, at 99% CI at df 10. Similarly association of anaemia of mother with birth weight was also significantly associated, p .006 at 99%CI at df 15.

Even though Smoking mothers were only 14 still association of smoking with LBW was significant p .03 at 5% level at 95% CI. Women who had spacing in between the children <1 year, had highest ratio of LBW; the co-relation was highly significant p .001 at.1% level at df 20. Similarly mothers with low BMI (< 18.5) were 118 in number. However association in our study was not significant p.092 at df 10. Parity of mother was highly significantly associated with LBW, p <.01 at .1 % level at DF 15. Majority of new born in our study were full

Table Ib. Association of Variables Under Study with Birth Weights of Study Group

	Grouped BW							
	<1.5kg	1.5-2.4 kg	2.5-2.9 kg	3-3.4KG	3.5--3.9 kg	4 kg and above	Total	Significance
6.Toxaemia Not suffered	8	57	127	34	8	13	247	Pearson Chi-Square Value Value=39.354, p= .000 at df 5, highly significant ,
Suffered	3	17	2	0	0	0	22	
Total	11	74	129	34	8	13	269	
7.Birth spacing								
<1 year	5	24	7	2	1	2	41	Pearson Chi-Square
1-3 years	4	30	73	14	6	6	133	Value 45.227[a]
3-5 years	2	19	43	17	1	4	86	df 20
>5 years	0	1	6	1	0	1	9	P=.001
Total	11	74	129	34	8	13	269	Highly significant at 99% CI
8.BMI								
<18.5	7	39	44	19	5	4	118	Pearson Chi-Square
<18.5 -24.99	2	26	70	12	2	8	120	Value 16.288[a]
>25	2	9	15	3	1	1	31	P=.092 at df 10
Total	11	74	129	34	8	13	269	not significant (95% CI)
9. Parity								
1-3	5	24	28	10	2	5	74	Pearson Chi-Square
4-6	6	50	101	23	5	8	193	Value 45.454
6-8	0	0	0	0	1	0	1	P =.000 at df 10
>8	0	0	0	1	0	0	1	Highly significant
Total	11	74	129	34	8	13	269	At 99% CI
10, maturity								
Term	5	49	111	27	6	10	208	Pearson Chi-Square
Pre-term	6	25	15	6	2	2	56	Value 26.030
post date	0	0	3	1	0	1	5	P =..004 at df 10
Total	11	74	129	34	8	13	269	Highly significant

Table 2. ANOVA : Comparing Standard Error of Difference of mean Birth Weights in Relation to Smoking, HT, BMI and Toxaemia of pregnancy

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	3.873	3	1.291	3.792	.011
Within Groups	90.220	265	.340		
Total	94.094	268			

term-208 in number and 56 were pre-term. However association was highly significant with LBW, p .004 at 99% CI at df10. ANOVA test indicated that association between the groups and within the groups regarding smoking, hypertension, BMIof mother and toxaemia of pregnancy was significant, p.011, F 3.79 at df 3 (*Table 2*). In our study only 22 pregnant mothers suffered from toxemia of pregnancy(pre-eclampsia, eclampsia). The association with LBW was highly significant p<.01 at 99 CI at df5.

Discussion

Prevalence of LBW in our study group was a little more than developing countries as whole in which it is 25% (10) Global incidence of LBW is 17%, and in developed countries 5-7 % (11). but is about the same as in India as well as in South East Asia i.e. 30% and 31% respectively. In East Asia Pacific it is 7%, Middle East and north Africa 15% (12). High prevalence of LBW could be as a consequence of civil war in Libya at that period of time, leading to scarcity of food items leading to malnutrition during pregnancy of under study mothers..

Regarding mothers' ages and LBW, our results were not in agreement with many studies. The reasons could be different socio-cultural factors. Association of hypertension in pregnant mothers with LBW in neonate in our study group was in congrurancy to Studies done

by American College of Obstetrics and gynecology and by Berghetta *et.al* (12,13). Similarly anaemia in pregnant mother and it's effect on LBW in the present study were same as in the Studies by Goldenberg *et.al*, Haggaz AD, Radi *et.al,* RasmussenKM *et.al* (14-16).Cigarette smoking in pregnant mothers and it's consequences on birth weight cannot be different basically, and our results are also in agreement with other studies done internationally, like US Department of Health & Human Services (17). Similarly spacing of births and birth weight results (*Table2*) simulate to studies done by Agarwal K *et al,* Ganesh S *et al* (18,19). Most of the research articles reveal positive association of BMI of mother to LBW , as in study by Vengashkhona L *et al* (20). However our study showed results in contrary to these researches.The reason being not much heterogenicity of BMI in most of the females. But the study results on association of parity of mother with birth weight are in agreement to Ashtekar SV *et al* (21).The significance of SED of means in our study is supported by Jammeh A, Ezugwu E, *et al* and Berilun Megabiaw *et al*, who showed similar results as that of ours(22-24). Our results of association of Toxaemia of pregnancy of mothers and LBW was directly proportional and the results agree to many studies including by Hustin J, *et al*. (25).The study shares the limitations of crossectional study, wherein only point prevalence could be calculated.Secondly ours being a hospital based study, it reflects only the tip of the iceberg of the problem of LBW in the community.

Conclusion

LBW is related to multiplicity of factors and cannot be corrected by a narrow pharmaceutical short cut .So, multi-factorial, multi dimensional and multi faceted interventions are the needs of developing countries. It includes,increasing marriageable age of girls, control of anemia, abstinence from smoking, control of hypertension, improving BMI of mothers,increasing birth spacing, reducing parity of mothers and controlling toxaemia of pregnancy and other congenital malformations.

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