

ORIGINAL ARTICLE

DETERMINANTS OF LOW BIRTH WEIGHT AMONG NEWBORNS AT AYUB TEACHING HOSPITAL, ABBOTTABAD

Mohammad Younas, Muhammad Waleed Khan, Junaid Alam, Mumtazullah, Mohammad Iftikhar Alam

Students, Ayub Medical College, Abbottabad-Pakistan

Background: Low birth weight (LBW) is an important predictor of health outcome of neonate in early and later life. Worldwide prevalence estimate of low birth weight is 15.5% and 95% contribution is from developing part of sphere. It is a significant health problem in Pakistan and increments the burden on ailing health services. This study was aimed to elucidate some of the important determinants so that effective intervention plan can be developed in light of these findings. **Methods:** The study was descriptive Cross-sectional study conducted in obstetric wards and labour room of Ayub Teaching Hospital. Sample size was 370 and non-probability convenient sampling was employed using researcher-made questionnaire. Data was analysed by computer software SPSS version 16.0. **Results:** Low birth weight frequency was found to be 30.3%. Mean birth weight was 2792.16±518.71 gms. About 78 out of 112, (70%) of LBW births were infants of anaemic mother and 62 (56%) of LBW babies were delivered by mothers residing in rural areas. Similarly 53% LBW births were among mothers with low socio economic status. Around 89 out of 112 LBW births were given birth by mothers performing more physically demanding work. **Conclusion:** Important positive association highlighted by this study are of maternal anaemia, working habits during pregnancy, residential background and maternal socioeconomic status with low birth weight outcome.

Keywords: Low birth weight, Incidence, Antenatal care, Rural and urban area, Socio-economic factors

Stud J Ayub Med Coll Abbottabad 2015;1(1):6-9

INTRODUCTION

Low birth weight (LBW) is birth weight below 2500 grams irrespective of gestational age of newborn.¹ Birth weight is an important determinant of survival and healthy growth in neonates. Low birth weight babies are categorized into two main groups, that is, those who are born prematurely and those with foetal growth restriction.²

World Health Organization (WHO) estimates that low birth weight prevalence worldwide is 15.5%. Low birth weight births are more common in geographic entities termed as 'developing countries' and they account for 95 per cent of all low birth weight births. Continent wise Asia has biggest chunk in prevalence and within Asia, Sub-continent has the highest prevalence with estimated, 11 million low weight births.² In Pakistan, recent estimates are not encouraging and some put its prevalence as high as 25%.³ In Khyber Pakhtunkhwa, 34% infants are reported to have less than average weight at birth. Maternal malnutrition and infections during pregnancy are most important risk factors for giving birth to low birth weight babies. Multiple pregnancy and negligent attitude towards antenatal care also contributes to increased LBW incidence.³

Low birth weight babies account for half of the perinatal and one-third of all infant deaths.⁴ It is also associated with significant morbidities like cerebral palsy, respiratory distress syndrome and is described to have positive statistical correlation with

psychosocial problems in school going children as well.⁵ In developing world the situation is very unfortunate, as it increases the disease load in community and incur significant financial costs to already meagre resources. Effective interventions like maternal fortification with supplementation of Iron and folic acid during pregnancy and prevention of infection have been suggested by various studies to decrease the low birth weight births and mortality and morbidity associated with it.⁶ Indirect interventions like family planning, improving hygienic conditions including sanitation and avoiding addictive habits like smoking can also play important role in decreasing LBW incidence.

The objectives of this study were to determine the frequency and determinants of low birth weight births in a tertiary care hospital (Ayub Teaching Hospital). Low birth weight incidence is significantly high in this region. Research studies in this locality and for this specific issue is scarce, so importance of such studies cannot be over stated. This is an attempt to help in the establishment of preventive measures and check the efficacy of measures already employed by healthcare setup.

MATERIAL AND METHODS

This was a descriptive cross-sectional study conducted in Obstetric wards and labour room of Ayub Teaching Hospital, Abbottabad from 16.06.2014 to 16.07.2014 370 women and their new-borns delivered at Ayub

Teaching Hospital were selected using non probability convenient sampling

A structured questionnaire was developed including all the independent and dependent variables of interest. The questionnaire was pre-tested twice before adopting a final version. Data was collected on the questionnaire. Informed consent was taken from all the subjects. The completed questionnaires were entered into the computer using SPSS version 16.0. Data was described in terms of frequencies and percentages for categorical variables. Continuous variables were described in terms of Mean±SD.

RESULTS

Among the total population of 370 respondents, mean gestational age was 37.7±2.83 months (Range 14-43). Mother's mean age was 28±5.5 years (Range 15-48). Mean monthly income was Rupees 13753±9365. Mean body mass index (BMI) was 25.86±11.27. Mean haemoglobin concentration in blood of mothers before delivery was 10.27±1.73 g/dl (Range 4.90 to 16g/dl).

Average birth weight of new born was 2792.16±518.71 grams (Range 1000 grams to 5700 grams). Most of the study participants belonged to rural area and constituted 55.1% (204) of study population, 30.3% (112) were from urban and 14.6% (54) were from semi urban area

Around 1.6% (6) of participants had low BMI which shows that this proportion was underweight,

53.2% (167) had normal BMI while 45.1% were overweight with high BMI. 69.2% (256) mothers were found to be anaemic before birth while the rest 30.8% (114) had normal haemoglobin concentration.

In the study population, 30.27% (112) births were of low birth weight and most of the rest, that is, 254 (68.65%) were of normal birth weight. Meagre 4 (1.08%) births were of high birth weight.

Two variables were compared that is 'birth weight group' and 'amount of work done during pregnancy' to determine if there is some association of any sorts. Out of total 112 low birth weight births, 79.4% (89/112) births were in the group which performed basic daily activities as well as household work but same held true for normal birth weight births group, as 83% (211/254) of total normal birth weight births belongs to mothers who perform both activities. Out of total 10 births in the mothers who performed basic daily activities, household as well as field work, 4 were low birth weight births. In basic daily activities group, 34% births were of LBW and remaining 66% (35) were of normal birth weight.

DISCUSSION

The results obtained by analysis, as evident by previous section, were in tabulated and figurative form. Different variables like maternal age, education, height, weight, body mass index, haemoglobin level before delivery, amount of work done during present pregnancy, mode of delivery, household monthly income, residential background and socioeconomic

Table-1: Different variables underconsideration during research

	Number	Minimum	Maximum	Mean	SD
Gestational age (in weeks)	370	14.00	43.00	37.69	2.83
Age of mother (in years)	370	15.00	48.00	28.01	5.50
Household monthly income (PKR)	370	1100.00	120000.00	13753.51	9364.93
Number of antenatal visits done during present pregnancy	370	0	20	4.55	2.92
Number of hours of sleep per day	370	2.00	18.00	8.24	2.34
BMI	370	16.00	39.04	25.86	11.27
Hb value immediately before delivery (in gm/dl)	370	4.90	16.00	10.27	1.73
Birth weight of new-born (in gms)	370	1000.00	5700.00	2792.16	518.70

Table-1: Comparison of different birth weight groups with amount of work done during pregnancy.

Birth weight group	Amount of physical work done during pregnancy				Total
	Basic daily activities only	Basic daily activities + field work	Basic daily activities + household work	Basic daily activities + household work + field work	
Low birth weight	18	1	89	4	112
Normal birth weight	35	2	211	6	254
High birth weight	0	0	4	0	4
Total	53	3	304	10	370

Table-3: Comparison of birth weight group with adequacy of haemoglobin level in mothers

Birth weight group	Hb group		Total
	Anaemic	Non anaemic (Normal)	
Low birth weight	78	34	112
Normal birth weight	176	78	254
High birth weight	2	2	4

status were explored in this study to determine any potential relation.

In our sample size of 370, mean birth weight was found to be 2792.16±518.70 grams which is consistent with other studies conducted in Pakistan. In a study conducted in Karachi, mean birth weight was found to be 2900 ±500 grams in a sample population of 832.⁷

Frequency of LBW babies in our study is 30.3% which is on the higher side compared to other studies conducted in Pakistan, which estimate it to be around 16–19%.⁸ This high frequency rate can be explained, as this study was carried out in a tertiary care hospital setup which cover only a small percentage of the total births and majority of the births take place at home. Usually, complicated pregnancies and people from predominantly lower socio-economic strata come for treatment in this setup where medical treatment is of low cost, that's why, these findings cannot be generalized to population at large.

One interesting finding of our study is that LBW birth frequency is higher among mothers having normal and higher BMI, and lower in mothers having low BMI. Some studies suggest that maternal BMI has no significant effect on birth outcome in developing countries.⁹ While others relate high maternal BMI with macrosomic babies and low BMI with LBW births in developed part of planet.¹⁰ Difference in findings can be attributed to the fact that developed communities have lower rates of infections and malnutrition and better access to health services and social welfare programmes which can increase prevalence of high maternal BMI that could lead to increased neonatal birth weight outcome.

Anaemia is strongly related with LBW births in this study. According to the results, 69.6% of LBW babies were delivered by anaemic mothers. This is consistent with ample research done on the subject of maternal haemoglobin concentration and birth weight. In fact, association is so strong that research is being directed to find if there is "causal relationship" or not.¹¹

The study also found that LBW births are more common among mothers residing in rural areas. About 56% of all LBW babies were delivered by mothers of that group. This is in line with various studies conducted in South Asia particularly India, where low birth weight prevalence in rural area was found to be high compared to that of highly privileged urban areas.¹² Association is similar to one that is between developed and developing world.

Similarly around 53% of LBW births occurred in mothers belonging to low socioeconomic strata. Various studies back this finding; women of low socioeconomic status inherently are at an increased risk for giving birth to low birth weight babies, irrespective of how socioeconomic status is defined, that is, by income, occupation or education.¹³

In this study, strenuous activity during present pregnancy is also strongly associated with LBW outcome. Around 80% of LBW babies were born to mothers performing household work in addition to basic daily activities. This is in accordance with previous literature which also attributes increased risk of LBW births in women performing strenuous activities. Jobs in which long standing is required are more at risk than relatively sedentary jobs. The association of physical activity with birth weight is more established in 1st Trimester.¹⁴

CONCLUSION

Low birth weight is still a leading health problem for neonates particularly in developing world. Therefore it is important to identify common factors associated with low birth weight prevalence. This study suggests some direct associations like that of decreased haemoglobin concentration and strenuous activity during pregnancy as well as indirect association of mother of low socioeconomic status and rural residential background with low birth weight births. Low birth weight frequency according to this study was 30.3%. No demonstrable association was found between maternal BMI with low birth weight outcome.

RECOMMENDATIONS

This study identifies some of the areas amenable to improvements. Iron supplementation, improved antenatal care, counselling regarding diet and food fortification are some of the measures which can be taken on priority basis for reduction in LBW prevalence. Mothers should be advised to avoid demanding activity, especially during first trimester and should rest as much as possible.

Furthermore, more studies on other socio demographic variables like parity of mother, unplanned pregnancy, birth interval, maternal infections and gender of child should be carried out to increase the understanding regarding the subject.

REFERENCES

1. Ahman E, Zupan J. Neonatal and perinatal mortality: country, regional and global estimates 2004. Geneva, World Health Organization, 2007.

2. World Health Organization. Report of the advisory group meeting on maternal nutrition and low birth weight. Geneva: WHO 2002.
3. UNICEF. Reduction of low birth weight: A South Asia priority. [Internet] 2013 [cited 2014 April 13]. Available from <http://www.unicef.org/rosa/Reduction.pdf>
4. Park K. Park's Textbook of Preventive and Social Medicine. 21st Ed. Jabalpur, India: Banarsidas Bhanot; 2009
5. Pei L, Chen G, Mi J, Zhang T, Song X, Chen J, *et al.* Low birth weight and lung function in adulthood: retrospective cohort study in China, 1948-1996. *Pediatrics* 2010;125(4):899-905.
6. Aranda N, Ribot B, Garcia E, Viteri FE, Arijia V. Pre-pregnancy iron reserves, iron supplementation during pregnancy, and birth weight. *Early Hum Dev* 2011;87(12):791-7.
7. Shams S, Low Birth Weight: Frequency and Association of Maternal Factors. *Pak Peds J* 2012;36(4):192-8.
8. Malik NA, Vaqar A, Razzaq A. Birth Weight pattern of newborns in hospital setup. *Pak Armed Forces Med J* 2008;58(1):36-40.
9. Ahmadu BU, Gofama MM, Ashir GM, Eniola AA, Rahman MA, Ambe JP. The effect of maternal pregnancy body mass index as a measure of pregnancy weight gain on neonatal birth weight in Maiduguri metropolitan council of Borno state, Nigeria. *Greener J Med Sci* 2012;2(6):168-72.
10. Kalk P, Guthmann F, Krause K, Relle K, Godes M, Gossing G *et al.* Impact of maternal body mass index on neonatal outcome. *Eur J Med Res* 2009;14(5):216-22.
11. Rasmussen K. Is there a causal relationship between iron deficiency or iron-deficiency anemia and weight at birth, length of gestation and perinatal mortality? *J Nutr* 2001;131(2S-2):590S-603S.
12. Ashtekar SV, Kulkarni MB, Sadaverti VS, Ashtekar RS. Analysis of Birth Weights of a Rural Hospital. *Indian J Community Med* 2010;35(2):252-55.
13. Reichman NE. Low birth weight and school readiness. *Future Child.* 2005;15(1):91-116.
14. Dwarkanath P, Muthayya S, Vaz M, Thomas T, Mhaskar A, Mhaskar R, *et al.* The relationship between maternal physical activity during pregnancy and birth weight. *Asia Pac J Clin Nutr* 2007;16(4):704-10.

Correspondence:

Mohammad Younas, MBBS Student, Ayub Medical College,

Abbottabad-Pakistan

Cell: +92-3139451791

Email: myounas94@gmail.com