International Journal of Basic and Applied Medical Sciences ISSN: 2277-2103 (Online)
An Online International Journal Available at http://www.cibtech.org/jms.htm
2013 Vol. 3 (3) September-December, pp.44-48/Mukesh et al.
Research Article

ETIOLOGICAL FACTORS ASSOCIATED WITH LOW BIRTH WEIGHT NEWBORNS

[*]Mukesh Dhankar[1], Rawat A.K.[2] and Varun[1]
[1]Department of Paediatrics, Pt. B.D. Sharma PGIMS, Rohtak-124001
[2]Department of Paediatrics, S.S. Medical College, Rewa (M.P.)
**Author for Correspondence*

ABSTRACT
Objective of the present study was to determine the etiological factors associated with low birth weight newborns. 300 consecutive LBW newborns were included in the study. A detailed proforma was filled in regard to maternal age, religion, rural/urban residence, socio economic profile, antenatal care, distance from hospital, education, parity and other associated maternal risk factors. Incidence of LBW was 26.8% in our study. Etiological factors significantly associated were rural residence, poor socio economic status, inadequate / no antenatal care, low education level and multiparity of the mother. The etiological factors for LBW newborns are not different from the factors which are associated with low birth weight for the last 3-4 decades. So need to improvement the maternal education, employment generation to improve socio economic status, improvement of antenatal care and strengthening the schemes like JSS which also includes the transport facility.

Key Words: *Etiological Factors, Low Birth Weight, Newborns*

INTRODUCTION
Low birth weight is increasingly recognized as a major cause of morbidity and mortality in neonatal period and infancy. Incidence of low birth weight varies from country to country and within a country, from region to region. Incidence is roughly 6-8% in United States whereas in developing country like India it has been estimated between 28-40% (Singh, 2004).

Newborns with birth weight 2500 gms or less are known as low birth weight. Low birth weight includes both premature as well as term small for gestational age babies.

Low birth weight is one of the major causes of high mortality and morbidity among newborns. Low birth weight may indicate that the baby did not remain in utero long enough or it did not develop well enough.

Incidence of low birth weight in our country is very high (28-40%). A large proportion of these babies are not premature; they are small for gestational age. Incidence of low birth weight has regional variation (Singh, 2004). A number of studies from various parts of country have given incidence between 20-40%.

Etiology of low birth weight is a complex interplay of various maternal, foetal and socio economic factors. Among the factors that were postulated to have an effect on low birth weight, maternal factor like maternal age, parity, education and place of residence were found to be prominent. Several studies have recorded the relationship between maternal age, parity, pre pregnancy weight and education of mother with LBW. But it is not clear as to whether all of these maternal factors are universal. The purpose of this study was to identify the relationship of social and obstetric risk factors of the mother with LBW.

MATERIALS AND METHODS
The present study "etiological factors associated with low birth weight newborns" has been carried in the Department of Paediatrics, Shyam Shah Medical College and Associated Gandhi Memorial Hospital, Rewa (M.P.) from May 2005 to August 2005.

A total of 300 consecutive newborns babies with birth weight 2500 gms or less, born in the Department of Obstetrics and Gynaecology at G.M. Hospital Rewa (M.P.) were included in this study.

A detailed proforma was filled including details of antenatal, natal and postnatal period. Various factors like socio economic status according to modified Kuppuswamy socio-economic status scale (Mishra,

2003), the distance from the hospital, religion and residence whether rural or urban were enquired about in detail.

Details of antenatal history including maternal age, provision of antenatal care, tetanus toxoid, iron folic acid supplementation and maternal complaints like fever and premature rupture of membrane was asked for. Details of natal history from records of Department of Obstetric and Gynaecology with mode of delivery were noted.

RESULTS AND DISCUSSION

Results

The study based on the analysis of 300 LBW mothers. In the present study, 70% of low birth weight babies were born to mothers less than 25 years of age and 30% of the LBW to mothers who were more than 25 years of age. This indicates that the mother who are 25 years or below had more risk of delivering the LBW. In the present study, there were 292 Hindu and 8 Muslim babies. There were no representations of any other religion. Due to the predominance of one group, religion was not considered as criteria for study. According to the place of residence, 68.7% of low birth weight babies belonged to rural area and 31.3% belonged to urban area. The birth weight was found to be statistically influenced by the parental residence location, incidence being higher in rural area.

In relation to maternal education, maternal illiteracy was present in LBW mothers i.e. 32.6% and whereas graduate and post graduate mothers were only 9.3%. Maternal education had statistically significant effect on birth weight. Lower education level was associated with more number of low birth weight babies. Low birth weight was more common in lower socio economic group, 70.6% in class IV, 20% in class III, 6.6% in class II and 2.6% in class I.

There was no representation in class V. Majority of the low birth weight babies belonged to families of lower socio economic status and this is statistically highly significant.

In relation to parity the number of multiparous mothers was 53.6% whereas primiparous mothers were 46.3%. Maximum number of low birth weight babies was observed in primi mothers and multigravida of order 3 or more. This observation was statistically significant.

In the present study, acceptable antenatal care ($\geq$3 visits) was received by only 24% mothers, antenatal care of at least some quality was received by 36% and in 40% cases, there were no antenatal visits. In rural area, there was more neglect in antenatal care. Statistically significant effect was observed between birth weight and antenatal care i.e. antenatal care was directly related to birth weight.

In the present study, 66% of low birth weight babies were from >10 km distance from hospital while 34.0% were within 10 km from the hospital.

The other maternal risk factors either related to pregnancy itself or other medical diseases, during pregnancy adversely affect the fetal development resulting in low birth weight babies. In mothers with history of pregnancy induced hypertension, small placenta and placental infarcts were incriminated as a cause of foetal malnutrition. Maternal risk factors like history of leaking due to premature rupture of membrane (>24 hours) was present in 19.3%, history of fever was present in 6.3% and history of pregnancy induced hypertension was present in 6.6% of mothers of low birth weight babies. History of leaking was more in mothers of low birth weight babies with <37 weeks of gestation.

Discussion

The results of the present study have indicated that there is a definite association between maternal and socio economic factors. No statistical significance was observed between maternal age and low birth weight babies. Similarly (Horon *et al.*, 1983; Mondal, 1998; Radhakrishan, 2004) also observed no significant results of maternal age on incidence and outcome of low birth weight babies. Our study failed to observe any relationship in regard to religion as there was poor representation of other religion. Similarly (Radhakrishnan, 2000) could not find any correlation between religion and low birth weight. With regard to place of residence, incidence of low birth weight was found to be higher in rural area which was statistically significant. Probable reason being delay in seeking medical care.

Maternal education had also statistically significant effect on birth weight. Lower education level was associated with more number of low birth weight babies. Similarly (Dhar, 1991) observed that 31.3% of illiterate mothers had low birth weight babies (Ghosh *et al.*, 1977; Pachauri, 1971; Hirvee, 1994) also observed similar results.

Table 1: Various Etiological factors

ETIOLOGICAL FACTORS	NO. (%)
Education	
Uneducated	98 (32.6%)
Primary	17 (5.6%)
Middle	67 (22.3%)
High school	58 (19.3%)
Inter	32 (10.6%)
Graduate	16 (5.3%)
Postgraduate	12 (4.0%)
Antenatal visits	
Nil visits	120 (40%)
< 3 visits	108 (36%)
$\geq$ 3 visits	72 (24%)
Socio economic status	
Class I	8 (2.6%)
Class II	20 (6.6%)
Class III	60 (20%)
Class IV	212 (70.6%)
Class V	-
Residence/Location	
Rural	206 (68.6%)
Urban	94 (31.3%)
Distance from hospital	
< 10 kms	102 (34%)
> 10 kms	198 (66.0%)

When comparing rural and urban part at the same education level, present study observed that there were more low birth babies in rural part, this was also statistically significant.

Poor socio economic status was more associated with low birth weight and statistically highly significant. In these families of low socio economic status the present study observed that majority were of rural background. Similar relation of socio economic class with low birth weight was reported by (Dhar, 1991; Singh, 1994; Mishra, 1988; Hirve *et al.*, 1994; Deshmukh *et al.*, 1988). Higher incidence of LBW was seen multiparous mothers of order 3 or more.

This observation was statistically significant and comparable with the literature as reported by (Ferrera *et al.*, 1991; Dhar, 1991; Kamaladoss, 1992; Singh, 1994; Horon, 1983; Mishra, 1988). Poor or no antenatal care was associated with higher incidence of low birth weight and it is statistically significant i.e. antenatal care was directly related to birth weight. Similar results were also observed by (Malik, 1997; Ferrera *et al.*, 1991; Mavalankar, 1993; Trivedi, 1986).

Mothers who were living more than 10 kms away from the hospital had higher incidence of low birth weight newborns. The probable reasons for this are delayed seeking of medical care. This is also statistically significant. Other maternal risk factors like history of premature rupture of membrane, history of fever, history of pregnancy induced hypertension. These factors are directly proportionate to the low birth weight babies and their outcome. Similar findings were observed by (Drillen, 1972; Kramer, 1987; Kamaladoss, 1992; Mishra, 1988).

Conclusion

In the present study we concluded that etiological factors which are associated with low birth weight newborns are not different from the factors which were associated with low birth weight for the last 3-4 decades. Despite inputs from government and different NGOs for last 3-4 decades, we have not been able to modify these factors. Hence to prevent and save these low birth weight babies, the present study recommends the following:

* Improvement of maternal education, both formal (school) and informal (through anganwadi).
* Employment generation to improve socio economic status.
* Improving antenatal care through anganwadi and primary health centre.
* Awareness for health programmes.
* Promotion of institutional deliveries and proper perinatal care by schemes like Janani Suraksha Yojna etc.
* Improvement in transport facilities.

REFERENCES

Desmukh JS, Motghare DD, Zodpey SP and Wadhva SK (1988). Low birth weight and associated maternal factors in an urban area. *Indian Pediatrics* **35** 33-6.

Dhar GM, Shah GN, Bhat IA and Butt N (1991). Low birth weight an outcome of poor socio economic obstetric interaction. *Indian Journal of Maternal Child Health* **2** 10-3.

Drillen CM (1972). Aetiology and outcome in low birth weight infants. *Developmental Medical Child Neurology* **14** 563-74.

Ferreira AMA and Harikumar P (1991). Maternal determinants of birth weight. *Indian Journal of Community Medicine* (XVI) 106-9.

Ghosh S, Hooza V and Mittal SK (1977). Biosocial determinant of birth weight. *Indian Paediatrics* **14** 2.

Hirve SS and Ganatra BR (1994). Determinants of low birth weight: a community based prospective cohort study. *Indian Pediatrics* **31** 1221-5.

Horon IL, Strobino DM and MacDonald HM (1983). Birth weights among infants born to adolescent and young adult women. *American Journal of Obstetrics and Gynecology* **146** 444-9.

Kamalados T, Abel R and Sampathkumar V (1992). Epidemiological correlates of low birth weight in rural Tamil Nadu. *Indian Journal of Pediatrics* **59** 299-304.

Kramer MS (1987). Determinants of low birth weight: methodological assessment and meta analysis. *Bulletin of WHO* **65** 663-737.

Malik S, Ghidiyal RG, Udani R and Waingankar P (1997). Maternal biosocial factors affecting low birth weight. *Indian Journal of Pediatrics* **64** 373-7.

Mavalankar DV, Gray RH and Trivedi CR (1993). Risk factors for preterm and term low birth weight in Ahmedabad, India. *International Journal of Epidemiology* **21** 263-72.

Mishra D and Singh HP (2003). Kuppuswamy's Socioeconomic status scale: a revision. *Indian Pediatrics* **70** 273-4.
Mishra M and Mishra SS (1988). Epidemiology of low birth weight in an industrial area in India **41** 374-6.
Mondal B (1998). Low birth weight in relation to sex of baby, maternal age and parity: a hospital based study on Tangsa tribe from Arunachal Pradesh. *Indian Medical Association* **96** 362-4.
Pachauri S and Marwah A (1971). A correlation study of birth weight and some maternal factors. *Indian Journal of Medical Science* 604-12.
Radhakrishan T, Thankkappan KR, R S Vasan and Sharma PS (2000). Socioeconomic and demographic factors associated with birth weight: a community based study in Kerala *Indian Pediatrics* **37** 872-6.
Singh D (1994). Birth weight: A community perspective. *Indian Journal of Maternal Child Health* **5** 31-2.
Singh M (2004). *Care of newborn* 6th edition New Delhi, Sagar Publications.
Trivedi CR and Mavalankar DV (1986). Epidemiology of low birth weight. *Indian Journal of Paediatrics* **53** 795-800.