

Incidence of Low Birth Weight Among the Nepali Babies of West Kameng District of Arunachal Pradesh

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KEY WORDS Low Birth Weight, Nepali Babies, West Kameng District, Arunachal Pradesh.

ABSTRACT A total of 233 Nepali single live births, born between 1/1/92 and 31/10/95 at the Bomdila District Hospital and Rupa Hospital of the West Kameng district of Arunachal Pradesh respectively were analysed. The present study reveals that- 1) 32.19% of babies are found to be as low birth weight. 2) Female babies had significantly higher rate of low weight than their male counterparts. 3) Mother's age was significantly related to the incidence of low birth weight. The teenage (<20 years) and older mothers (≥35 years) had delivered significantly a higher percentage of babies with low birth weight than that of those mothers aged between 20 and 34 years. 4) No significant relationship was exist between parity and incidence of low birth weight. Primipara mothers had significantly a higher proportion of low birth weight babies as compared to those mothers belonged to 2-4 parity. 5) The teenage and also primipara mothers had a higher risk for delivering low birth weight babies than of the older mothers and also who belonged to ≥5 parity respectively. The present study suggests to carry out a further study to explore the effects of other bio-social factors on the incidence low birth weight in this population.

INTRODUCTION

A low birth weight (LBW) infant starts his life with a handicap not only with respect to chances of survival but also for his postnatal growth and development (WHO, 1984; Lechtig, 1980). Over half of the perinatal and one third of the infant death in all over the world are due to LBW (Park, 1994; Malik et al., 1997). The condition of maternal health and nutrition during pregnancy is reflected by the proportion of babies with LBW and it also indicates the socio-economic development of the population group of any region or any country (WHO, 1980; Murthy, 1990). At present, the incidence of babies with LBW in India is accounted for 28.2% (Gopalan, 1996) in comparison with 4-5% found in economically developed countries (Kamaladoss et al., 1992). LBW has a multifactorial aetiology and the possible determinants are mother's age, parity, sex of baby, gestation

period, mother's height, birth spacing, tobacco chewing and smoking habit in pregnancy, place of residence, socio-economic condition, antenatal care etc. (Kramer, 1987; Makhija and Murthy, 1990; Kamaladoss et al., 1992; Malik et al., 1997). Kulkarni (1993) is of the opinion that birth weight is used as an index of population study. Population wise data on birth weight is scanty in our country as most of the studies are reported from the different hospital are based on mixed population. Only few population wise studies on birth weight are so far available in this country (Banerjee, 1969; Barua, 1973; Mittal et al., 1976; Das and Devi, 1982; Pakrasi et al., 1985; Kamalados et al., 1993; Kulkarni, 1993 and Mondal, 1995; 1998a; 1998b; 1999). Keeping all these views in mind, the present study was carried out on the Nepali population of Arunachal Pradesh. The objectives of the present study are to find out the incidence of babies with LBW and to examine the influence of sex of baby; mother's age and parity on the incidence of LBW in the present population. The Nepali is a generic term and it derives from the name of two kings "Ne" and "Pal" (Maitra, 1994). This population is divided into many castes and subgroups referred to as Jati. The Nepali migrated to the North-East India in early nineteenth century (Subba, 1994). The total census figures for this population in Arunachal Pradesh was 45,508 in 1981 (Timsina, 1992). The Nepali have floating population in almost all the district of Arunachal Pradesh. In the West Kameng district of this state, a good number of the Nepali people have been settled permanently as labourer or traders and a few of them are also engaged in various services.

MATERIAL AND METHODS

The present data were collected from the

Bomdila District Hospital and Rupa Hospital of West Kameng district in Arunachal Pradesh. The Rupa Hospital is situated under the Kalaktang Circle of West Kameng district of this state and it is 18 km. away from the Bomdila, Headquarter of West Kameng district. Data for the present study pertains to 241 Nepali mothers whose pregnancy information were recorded in the birth registers of the aforesaid two hospitals, between 1\1\92 and 31\10\95. Out of this 240 mothers 102 and 139 of them gave birth their babies at Rupa and Bomdila district hospitals respectively. After excluding of twins, still births and the missing information about birth weight of a few babies, the present study is based on 233 Nepali mothers and their single live births. Babies weight at birth were recorded in gram in the birth register. Besides birth weight, sex of baby, mother's age, parity, name of the community, date and mode of delivery were also recorded. LBW is defined as birth weight of less than 2500 grams (WHO, 1984; Gopalan, 1996). The χ^2 test, proportion test, odds ratio and 95% confidence limit (CI) Rao and Richard, 1996) have been performed for statistical inference in the present study.

RESULTS AND DISCUSSION

Table 1 shows the incidence of LBW by sex of baby. It appears that the frequency LBW is found to be 40.49% for females and 25.76% for males. The odds ratio is found to be 1.97, which means that a female baby had 1.97 times the risk of a male baby of being LBW. The sex difference in respect of LBW is found to be statistically significant (χ^2 -5.77; d.f. 1; $p < 0.05$) as seen in earlier studies (Pakrasi et al., 1985; Makhija and Murthy, 1990, Malik et al., 1997 and Mondal, 1998a). It may, however, be mentioned that some earlier workers (Trivedi and

Mavalankar, 1986; Kamaladoss et al., 1992) have failed to show any significant difference between sex in respect of the incidence of LBW. Many researchers (Sing et al., 1982; Kumar and Datta, 1984) are of the opinion that since risk of death for Indian infants in the birth weight category of 2000-2500 g is less than that of the developed countries, a cut-off point for LBW of equal to or less than 2000 g would be more appropriate for this country. Considering this criterion, the incidence of LBW varies between 9.60 and 11.94% in India (Makhija and Murthy, 1990). Using this criterion, 11.94% of newborns in the present series are suffering from LBW. The range of birth weight in the present sample lies between 1100g. and 4050g. the overall incidence of LBW in the present population is accounted for 32.19% considering all babies weighing <2500g at birth. So far available population wise data on LBW in North-East India, the incidence of LBW is found to be 21.53% among the Nepali of Meghalaya and it is 28.40, 27.75, 29.80% for the Tangsa, Sherdukpen and Monpa of Arunachal Pradesh, respectively (Mondal, 1995, 1998a, 1998b, 1999). After following the weight criteria for LBW of equal to or less than 2500g, among the Assamese babies of Assam it was 45.8% (Barua, 1973), while it was 26.11% among the Meities babies of Manipur (Kulkarni, 1993). Therefore, it is seen that the frequency of babies with LBW varies from one population group to another even it varies in the same population group of one region to another region. For example, we have been seen such variation in respect of the incidence of LBW between the babies of Meghalaya (21.50%) and Arunachal Pradesh (32.19%). It might be due to different environmental condition into which those Nepali mothers are lived.

The relationship between mother's age and incidence of babies with LBW has been given in table 2. A consistent decreasing trend in the percentage of babies with LBW is noticed from the mother's age group of <20 years to 34 years and it shoots up at ≥ 35 years. This difference is found to be statistically significant ($P < 0.001$). A similar observation was reported by Ghosh et al. (1997); Malik et al. (1997). It is further seen from the results of the proportion test that the teenage mothers (<20 years) and older

Table 1: Incidence of low birth weight by sex of baby

Sex of baby	No. of babies	Birth weight of babies	
		<2500g	≥ 2500 g
Male	132	34 (25.76)	98 (74.21)
Female	101	41 (40.59)	60 (59.41)
Total	233	75 (32.19)	158 (67.81)

Figures in parenthesis indicate percentage
 χ^2 - 5.77, d.f. -1; $P < 0.05$; odds ratio - 1.97

Table 2: Incidence of low birth weight by mother's age

Mother's age (in yrs.)	No. of babies	Birth weight of babies	
		<2500g	≥2500g
<20	35	21 (61.00)	14 (40.00)
20-24	83	20 (24.10)	63 (75.90)
25-29	51	11 (21.57)	40 (78.43)
30-34	33	6 (18.18)	27 (81.82)
≥35	31	17 (54.84)	14 (45.16)
Total	233	75 (32.19)	158 (67.81)

Figures in parenthesis indicate percentage
 χ^2 -27.80; d.f. -4, $P < 0.001$

Results of proportion test and odds ratio:

Group compared	Critical ratio for the proportion test	Odds ratio (95% c.i.)
<20 yrs. Vs. 20-34 yrs.	* 4.36	5.27 (4.50-6.03)
≥35 yrs. Vs. 20-34 yrs.	* 2.81	4.26 (3.45-5.06)
	* $P < 0.01$	

mothers (≥35 years) have delivered significantly a higher proportion of babies with LBW in comparison with the proportion of babies with LBW, born to the mothers, aged between 20 and 34 years and also a higher incidence of LBW babies are born among these teenage mothers. A similar results were observed in many earlier studies (Chakraborty et al. 1975; Pakrasi et al. 1985; Trivedi and Mavalankar 1986; Makhija and Murthy 1990; Kamaladoss et al. 1992; and Mondal 1995; 1998a). The results of odds ratio also indicate that the teenage mothers had 5.27 times and the older mothers had 4.26 times the risk of delivering LBW babies than that of those mothers belonged to the age group of 20-34 years. It seems that the teenage mothers had at higher risk for developing more LBW babies than the older mothers. So, the present findings are also in agreement with the other studies (Schelp and Pongpaew, 1985; Kamaladoss et al., 1992 and Mondal, 1998a). In this connection, the possible explanation for such higher incidence of babies with LBW among the teenage mothers is due to their reproductive or anatomical immaturity (Joubert, 1991; Cooper et al., 1995).

Table 3 shows the incidence of babies with LBW in relation to parity. It is observed that the percentage of babies with LBW decreases steadily from primipara to third parity and thereafter it increases as parity increases too. This

Table 3: Incidence of low birth weight by parity

Parity	No. of babies	Birth weight of babies	
		<2500g	≥2500g
Primi	85	37 (43.53)	48 (56.47)
2nd	53	13 (24.53)	40 (75.47)
3rd	39	8 (20.51)	31 (79.49)
4th	26	7 (26.92)	19 (73.08)
≥5th	30	10 (33.33)	20 (66.67)
Total	233	75 (32.19)	158 (67.81)

Figures in parenthesis indicate percentage
 χ^2 -9.21; d.f. -4, $P < 0.05$

Results of proportion test and odds ratio:

Group compared	Critical ratio for the proportion test	Odds ratio (95% c.i.)
Primi vs. 2nd-4th parity	* 3.28	2.48 (1.87-3.08)
≥5th parity vs. 2nd-4th parity	1.34	1.61 (0.74-2.47)
	* $P < 0.01$	

seems to be an agreement to some earlier studies (Selvin and Grafinkel, 1972; Chakraborty et al., 1975; Macleod and Keily, 1988). In contrast, Srivastava et al. (1971); Fedrick and Adelstein (1978) have found that the incidence of LBW decreases from primipara to second parity only and then it increases with the increasing of parity. Again, few earlier studies (Ghosh et al., 1977; Pakrasi et al., 1985), have reported that the percentage of LBW babies decreases steadily from primipara to fourth parity and after which it increases. However, the present results indicate that parity had no significant influence $\chi^2 = 9.21$; $P > 0.05$ on the incidence of LBW as generally observed in other studies (Arazo and Salzano, 1975; Pakrasi et al., 1985). So, this result is somewhat unexpected as many earlier workers have found a significant impact of parity on the incidence of babies with LBW (Trivedi and Mavalankar, 1986; Makhija and Murthy, 1990; Kamaladoss et al., 1992; Malik et al., 1997 and Mondal, 1998a). From the present analysis, it is also found that the proportion of babies with LBW, born to the primipara mothers are significantly higher (Critical ratio - 3.28; $P < 0.01$) than that of the LBW babies belong to 2-4th parity. The results of odds ratio indicate that the primipara had 2.48 times and ≥5 parity 1.61 times the risk over the parity between second and fourth for delivering LBW babies. So, the primipara mothers were

at a higher risk of developing LBW babies and this result is in conformity with some other studies (Chakraborty et al., 1975; Trivedi and Mavalankar, 1986; Makhija and Murthy, 1990; Kamaladoss et al., 1992 and Malik et al., 1997). In this connection, one may recall the statement made by Chakraborty et al. (1975) that Primipara mothers represent a rather different qualitative situation than that of the multiparous mothers.

In fine, the present study is based only upon three factors (*i.e.*, sex of baby, mother's age and parity), so, there is an urgent need for conducting a further study with a view to finding out the other bio-social factors which may have influence on the incidence of babies with LBW in this population as well as other population groups in this North-Eastern region and which ultimately may help to understand the problems of LBW at the population level.

ACKNOWLEDGEMENT

The author is thankful to Dr. B.C. Sharmah, Medical Superintendent, Rupa hospital and Dr. P.D. Thongchi, Physician, Bomdila District Hospital, West Kameng district of Arunachal Pradesh for allowing me to collect the present data from their hospitals.

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