CHAPTER II

REVIEW OF LITERATURES AND AIMS AND OBJECTIVES OF THE PRESENT STUDY
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A brief review of the available literatures related with the studies of newborns especially for the assessment of growth pattern, health and nutritional status and their relationship with bio-social influencing factors have been given in this chapter in order to get some background information of the present study. Moreover, the aims and objectives have also been given hereafter.

General

Since the first systematic study of birth weight of newborns in Brussels, Belgium by Quetelet in 1871, large number of studies have been carried out to show the variables affecting the birth weight of diverse population groups of different parts of the world. Significant variations in the birth-weight have been observed between 270 groups of populations and the variations are due to both genetic and environmental factors (Meredith, 1970). Mean birth weight might vary from 2400 gm in New Guinea (Wark and Malcom, 1969) to 3800 gm in West Indies (Ashcroft. et al. 1966). Of particular interests are the studies in birth-weight regardless of socio-economic status or geographical location (Ounstead and Ounstead, 1973).

Major social or ethnic groups have a characteristic distribution of birth weight and its uniqueness is undoubtedly due to both genetic and environmental factors (Comas, J, 1960). However, several other studies on siblings (Mueller, W. H and E. Pollitt, 1982), cousins (Robson, 1985) and consanguineous matings (Morton 1958; Asha Bai, P.V. and T.J. John, 1982; El-Alfi., O. et al. 1969; Magnus, P. et al.1985; Honeyman, et al. 1987) have found little evidence of a major genetic component. Morton (1968) demonstrated that diversity in birth weight corresponds closely to the adult stature which is not a rigid criteria in ethnic studies by itself and is the result of interaction of the genetic component with environment and shows secular trend.
Some specific genetics and other influences such as parity and gestation are also known to affect birth weight. Members of families tend to have similar birth weight; low birth weight is the rule in some of the chromosomal defects, while diabetic mothers tends to have heavy infants at birth (Laskar, 1961). It is also known that mothers of the children with low birth weight were themselves small at birth (Young, 1979). Maternal physiology and the intrauterine environment are known to affect size of the infants at birth (Robson, 1978) and heredity may mediate the effect of maternal supplementation on the physical growth of the fetus and infant (Mueller and E. Pollitt, 1982).

Determinants of low birth weight in developing countries include maternal nutritional status before and during pregnancy, maternal diet, and perhaps exposure to smoke and infection rates during pregnancy (Martorell, R. and G.C.Teresa, 1987). Moreover, studies from around the world have demonstrated that dietary intervention during pregnancy is almost always associated with increased birth weight. Martorell and Teresa (1987) further observed that nutritional supplementation interacts with maternal nutritional status and newborns of well-nourished women benefit little, if any, from dietary supplementation of their mothers during pregnancy, whereas newborns of poorly nourished women (thinnest and shortest) show substantial improvements in birth weight. In another study of Adair, L.S. and M.P. Barry (1988), it has shown that the determinants of weight and proportionality at birth differ markedly among the Filipino infants.

Anthropometric evaluation of the eyes and periorbital structures in the newborn infant has an important role in the early diagnosis of several syndromes and birth defects (Feingold and Pashayan, 1983). Demirkal, et al., (1988) who worked in the newborn of Turkey indicated that regardless of sex, gestational age and birth weight, a value exceeding 7.5% for inner canthal index shows hypertelorism (an abnormal distance between numbers of paired organs) and a value over 43% for canthal index is compatible with a diagnosis of ocular pseudohypertelorism.

Another study has suggested that smoking is strongly associated with size at birth (Schell, L.M. and C. H. Denise, 1985) and that implies that variation in human growth patterns is very much influenced by behaviours. Various such studies have
been carried out in different parts of the world mostly in developed countries on various factors associated with size at birth.

In recent years also, the study of the newborns on various aspects has been on the increase in different parts of the world as its importance is well established. However, there is still shortage of data from the developing countries including India. That is why WHO (1980) suggested that research emphasis should be given on the developing countries in relation to the newborns.

India

In India no systematic effort has been made to provide birth weight norms for neonates on regional or on population basis. However, there are many studies such as on Bihari neonates by Prasad (1956), on the newborns of south India by Sen (1959), Achar and Yankaurer (1962), Sarkar, D. (1968), on the neonates of Central Rajasthan by Gupta and D.C. Shard, (1972), on intra-uterine growth of northern Indian babies by Ghosh, et al. (1971) etc.

Sen (1959), some 40 years back, has shown that birth weight is directly proportional to the nutritional status of the mother. Economy is an indicator of birth weight. In different studies of Mukharjee, et al. (1959), Achar and Yankaurer (1962) and Udani (1963), it has found that birth weight of the upper class in India are higher than those of the poorer class as a result of fetal malnutrition due to poor maternal health and nutrition in the low and middle class. Ankegowda, K and M.S. Sumitra (1976) has shown that mean birth weight increased consistently with the increase in total calories and protein and the increased in birth weight was statistically significant. Regarding the effect of inbreeding on neonatal measurements, Asha Bai, P.V. and John (1982), studying on the south Indian newborns has reported no significant reduction in birth weight with consanguinity. But on the contrary, Kulkarni and Kurian (1990), Badruddoza, et al., (1995), have shown that birth weight is reduced in consanguineous offspring to a greater extent relatively than other anthropometric measurements.

Chhabra, S. and Seema Sharma (1994) and Jaya, D.S. et al., (1995) from the Maharashtra neonates and Kerala newborns respectively recorded that birth weight was directly proportional to their placental weight. In another study of Murthy (1991) and
NIN Dec. (1992), it has been observed that low birth weight is the result of inadequate support provided by the maternal organism.

Regarding bio-social factors, a specific pattern has been observed in many studies. Sanjay, et al. (1994) and Swain, et al., (1994) who worked on the Pondichery neonates have pointed out that on improving the female literacy and socio-economic status, on increasing the age at marriage for females to 20 years and inter pregnancy interval more than 24 months can bring down the incidence of low birth weight babies. Further also suggested that birth weight was best correlated with the height and weight of the mother. Similar patterns have been observed by Sarkar .D (1968), on the South Indian babies and also again observed by Nayar, S. et al., (1994), Dhar, G.M. and G. N. Shah (1994) and Kulkarni, V.S. and S. Shaunak (2000) in different studies of Wardha, Srinagar and Pune neonates respectively. In another study of Lal, Sundar and Ramesh Goomer (1994), it has been found that besides socio-economic factors, birth control, adequate eating during pregnancy and initiation at early breast feeding can reduce the incidence of low birth weight babies and consequently better child survival.

In another study of Visweswara, et al., (1999), it has been reported that measurement of length with weight or BMI (body mass index) at birth are better than any single measurement in the assessment of the nutritional status of newborns.

In many developing Nations, a significant number of babies are low birth weight. The proportion in India being as high as 30% (UNICEF, 1992) low birth weight babies, it runs the risk of higher mortality and morbidity. However, with better early neonatal care, the prospects of survival of low birth weight babies are greatly increased, if they are referred in time. Even elementary facilities for weighing the newborn are not available in most situations, since almost 80% of the deliveries in India occur at home or in the community (Kumar V. and N. Dutta 1984; Bhargva S.K., et al., 1985; WHO 1981), thereby making it difficult, if not impossible to identify the babies at risk because of low birth weight and to provide them or refer them for timely and appropriate care. In order to meet this problem various studies for estimating birth weight from some other simple anthropometric measurements specially calf circumference and mid upper arm circumference have been suggested. The study of Sharma, et al. (1989) and Sachar, et al. (1994) among the Ludhiana
neonates are worth mentioning. They reported that calf circumference is a simple, cheap, reliable and quick indicator for predicting low birth weight in any community.

In North-east India, the work on birth weight and other measurements of the newborn babies is quite scanty. On the individual level and group level, the work of Barua (1973); Devi (1980); Das and Devi (1985) and Sengupta and Barua (2002) on Assamese neonates and Das, P.B. and B. Bhattacharjee (1986) on both the Bengali and Assamese neonates of Guwahati are worth mentioning. Das, P.B. and Bhattacharjee in their investigation, reported that there was no sexual differences in both the Asamese and the Bengali populations of Guwahati. But the Assamese babies were heavier than those of the Bengali babies, although the difference was not significant so that the mean birth weight of Assamese was 2.72 kg while that of Bengali was 2.63 kg. Sengupta, S and M. Barua reported that the mean weight of the 408 newborn Ahom was 2.81 kg and further observed that maternal education, body weight and antenatal care visits influenced the birth weight significantly.

**Manipur**

In Manipur, data on newborn are scanty except a few sporadic ones. In 1980, Singh, Kh. T. *et al.* reported that among the Manipuri newborns the mean birth weight was 2.82 kg and prevalence of premature babies might be due to low-socio-economic conditions, associated with maternal disease including anaemia, multiple pregnancies and premature deliveries. It has been further suggested that with better standard of living, improved diet and regular antenatal cares, birth weight should be increased. Similar patterns of premature babies have been observed in the studies of Singh, T.G. and R.K. N.S. (1989) and Singh, N.N. and S. Reddy (1997).

Singh, N.N. and S. Reddy (1997) further pointed out that incidence of low birth weight among the smokers were two times more than that of the non-smokers. These few available data of Manipur were concerned mainly with low-birth weight and premature studies. Moreover, the data have not specified any ethnic or community classification of the newborns.
AIMS AND OBJECTIVES

In Manipur, the Meiteis comprising a population of about 12 lakhs (Census, 2001) is one of the major ethnic groups which inhabit more area of the Manipur valley. They are very distinctive from the neighbouring communities in respect of their food pattern, custom, religion etc. Hence to study the Meitei newborns firstly has the reason to justify.

The chief aims and objectives of the present study are:

1. As the newborns are the indicatives of the health prospect of the future generation of a population, the present study has primarily aimed at a systematic study of the Meitei newborns on the basis of certain salient somatometric characters.

2. Besides, a few morpho-genetical characteristics shall also be studied among the newborns of the present population.

3. Attempts shall also be made to show the relationship between the growth of the newborns and the socio-economic or obstetric factors of their respective mothers.

4. Moreover, the bi-sexual variations in respect of the somatometric variables in the light of gestational variations of the newborns shall also be assessed.

5. Finally, among the newborns attempt shall also made to compare the present data with the available data of other populations.

A brief profile on the land and the Meiteis on whom the present study has been based on will follow in the next chapter.