

## BIRTH WEIGHT PATTERN OF NEWBORNS IN HOSPITAL SETUP

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### ABSTRACT

**Objective:** The objectives of the study were to determine the distribution of the birth weight of the newborns and identify the effects of gender, parity and socioeconomic status on it.

**Place and duration of study:** CMH Thal (Kohat), KRL Hospital Kahuta and POFs Hospital Wah Cantt from Jun 2002 to Sep 2005.

**Patients and Methods:** All the live born singleton normal babies born between 37-42 weeks of gestation were included. Premature babies, babies with congenital anomalies and those born to the mothers with malnutrition, obesity, anemia, chronic illnesses and obstetric complications were excluded from the study. Birth weight of each baby was measured to the nearest 100 gram on a baby weighing scale. Infants having birth weight of 2.5-4.0 kg were termed as normal birth weight, those less than 2.5 kg as low birth weight and more than 4.0 kg as large weight babies. Data was analyzed using SPSS v.10.

**Results:** The total number of babies was 1026. Males were 54% and females were 46%. Mean birth weight was 3.08 kg. Birth weight ranged from 1.6 kg to 5.0 kg. Mean birth weight of male babies and babies of higher socioeconomic group was higher than that of the females and the babies of lower socioeconomic group. Seventy nine percent of the neonates had a normal birth weight. Sixteen percent had low birth weight and only 5% were large babies. There was no significant difference in the mean birth weights of the babies of mothers with different parities.

**Conclusion:** This study revealed that majority of analyzed population had normal birth weight. Male neonates and babies of higher socioeconomic group were heavier as compared to females and those of lower socioeconomic group. Parity however did not have any significant affect on the birth weight.

**Keywords:** Birth weight, newborn, socioeconomic status, parity

### INTRODUCTION

Birth weight is a good indicator of community health [1]. It is a good tool for assessing health care delivery at community level as well as the status of the mother prenatally and during pregnancy. It is considered a predictor of neonatal viability and has an inverse relationship with neonatal and perinatal mortality which are exceptionally high in Asian countries [2-4]. It also remains an important factor affecting

infant and child mortality [5]. In a study by Tariq and Kundi, sixty-eight percent of mortality was contributed by low birth weight [6].

Birth weight depends on gestational age and fetal growth during pregnancy. Environmental factors can affect both these variables. Birth weight distribution is an important indicator of environmental effects on fetal development and is a more sensitive tool than perinatal deaths, miscarriages and malformations [7].

Many factors affect the birth weight including socioeconomic status [7], maternal nutritional status, anemia, maternal illnesses, drug addiction, smoking habit, prenatal care, obstetric complications [8] and complications of pregnancy [2,9]. Other factors include single parent families, teenage pregnancies, multiple and closely spaced pregnancies, parity [10], birth order [11], sex of the baby, maternal height and age [5,11,12].

Lower socioeconomic status, poor maternal nutritional status, maternal anemia, chronic illnesses, drug addiction, smoking habit, teenage pregnancy and maternal short stature are associated with low birth weight. Maternal diabetes mellitus, maternal obesity and high parity are associated with large birth weight.

According to WHO, birth weight of less than 2500 grams is considered as low birth weight. Below this weight neonatal mortality rises rapidly [13]. The literature suggests that the incidence of low birth weight is 19% in Pakistan [14], ranges from 39-40% in India [3,5,12], 15% in Bangladesh [13], 6.1% in Eastern Asia, 6.8% in Western Europe, 17% in West Africa and 13.5 % in East Africa [2].

The objectives of the study were to determine the distribution of the birth weight of the newborns in our setup and to identify the effects of gender, parity and socioeconomic status on it.

## **PATIENTS AND METHODS**

This study was carried out in CMH Thal (Kohat), KRL hospital Kahuta and POF hospital Wah Cantt from Jun 2002 to Sep 2005. All the live born singleton normal babies born between 37-42 weeks of gestation was included using non-probability convenient sampling. Premature babies, babies with congenital anomalies and those born to the mothers with malnutrition, obesity, anemia, and chronic illnesses like diabetes mellitus, hypertension, chronic renal failure and obstetric complications were

excluded from the study. Nutritional assessment of the mothers was done on the basis of BMI using standard BMI chart. Mothers with BMI less than 18.5 were labeled as malnourished and those with BMI 30 or more were termed as obese.

As the effect of only gender, parity and socioeconomic status on the birth weight was assessed, therefore all such maternal and fetal factors which could act as confounders to the defined variables were excluded from the study.

Data gathered included gestational age, gender and weight of the baby as well as parity and socioeconomic status of the mother. For socioeconomic status, mothers were divided into two groups. Higher socioeconomic group (group 1) included wives of the officers whose monthly income was more than Rs.7000 and lower socioeconomic group (group 2) included wives of the lower ranks whose monthly income was less than Rs.7000. For the parity mothers were divided into three groups. Primaegravida (mothers with first pregnancy), multipara (mothers with 4 or less than 4 pregnancies) and grandmultipara (mothers with more than 4 pregnancies).

Birth weight of each baby was measured without clothes to the nearest 100 gram on a baby weighing scale within one hour of birth. Baby scale was calibrated before weighing each baby. Infants having birth weight of 2.5-4.0 kg were termed as normal weight babies, those less than 2.5 kg as low birth weight and more than 4.0 kg as large weight babies.

## **DATA ANALYSIS**

Data was analyzed using SPSS ver-10. Mean  $\pm$  SD and percentages were used to describe the data. Student's t-test was used to compare mean birth weight according to gender, parity and socio-economic groups.

## **RESULTS**

The total number of babies was 1026. Males were 541 (53.5%) and females were 469 (46.5%) (figure). Male to female ratio was 1.2:1.

Mean birth weight was 3.08 kg ± 0.55 with the range from 1.2 Kg to 5.0 kg. Mean birth weight of male babies was 3.12 kg ± 0.56 and that of female babies 3.04 kg ± 0.53. Difference between the mean weights of male and female babies was 0.08 kg with p-value of 0.459.

In this study, majority (79%) of the neonates had a normal birth weight, 16% had low birth weight and only 5% were large birth weight babies (table-1).

Difference in the mean birth weight of low birth weight and normal weight babies was 0.98 kg and between the large birth weight and normal babies was 1.21 kg.

Mean birth weights of the babies of different socioeconomic groups are elaborated (table-2).

Twenty percent of the children belonged to higher socioeconomic group with the mean birth weight of 3.31 kg and 80% belonged to lower socioeconomic group with the mean birth weight of 3.03 kg. The mean birth weight of higher socioeconomic group was 0.28 kg more than that of the lower socioeconomic group with a p-value of 0.749.

The relationship of mean birth weight with maternal parity (table-3). Grand multipara had the highest mean birth weight followed by multipara and primigravida mothers.

Table-1: Mean birth weights (n=1026).

Weight category	No (%)	Mean birth weight (kg)	Std deviation
Low birth weight	167 (16%)	2.23	± 0.30
Normal birth weight	809 (79%)	3.21	± 0.35
Large birth weight	50 (5%)	4.42	± 0.38

Table-2: Mean birth weight in relation to socioeconomic status (n=1019).

Socioeconomic group	No (%)	Mean birth weight	P-Value
1	204 (20)	3.31 kg ± 0.53	
2	817 (80)	3.04 kg ± 0.54	0.000

## DISCUSSION

Mean birth weight of 3.08 kg in this study

Table-3: Mean Birth weight in relation to parity (n=1026).

Parity group	No (%)	Mean birth weight (kg)	Std deviation
Primigravida	219 (21)	3.06	± 0.55
Multipara	564 (55)	3.11	± 0.58
Grand Multipara	243 (24)	3.14	± 0.56

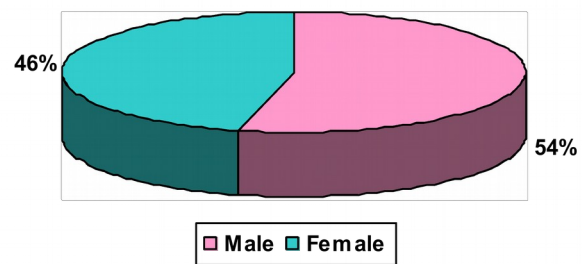


Figure: Gender distribution of patients.

was comparable with the other studies conducted in similar circumstances. In a study conducted by Najmi [9], the mean birth weight of 1156 neonates was 2.9 kg. These results were also comparable with the studies of other developing countries like India [3,11,12], Bangladesh [13], African countries like Ghana [15] and New Guinea [16]. However this mean birth weight was slightly lower than that of the economically developed countries like Saudi Arabia [17] (3.31 kg) and Kuwait [18] (3.5 kg).

The mean birth weight of 2.23 kg of low birth weight babies was comparable to the mean birth weight of 2.08 kg of low birth weight babies in a similar study by Khan and Jamal [8].

In this study, majority (79%) had normal birth weight, 16% were low birth weight and only 5% were large birth weight babies. These results were consistent with the results of another study from Pakistan in which low birth weight babies were 19% and only 3% were large birth weight babies [9]. These were also comparable with the results of Dhar et al

from Bangladesh who found 15.18% of their babies to be low birth weight [13].

The low birth weight values of 16% in this study and 19% reported by Najmi [9] are consistent with 19% incidence of low birth weight in our general population [14]. However, these figures are still higher than the recommendation of WHO for developing countries for reduction of their low birth weight incidence to less than 15% [3]. These figures of low birth weight are also higher than that of the economically developed countries like Saudi Arabia [17] (4%) and Kuwait [18] (3.4%).

These figures are far low as compared to the neighboring country India [3,5,12] where different studies have shown incidence of low birth weight as high as 39-40% and other developing countries like New Guinea [19] (40%).

The mean birth weight of males was higher than that of the females which was consistent with the results of similar studies from different countries. In a study by Parveen [20] from Pakistan, it was found that male babies were heavier than females at each gestational week.

Mathai et al [11] from India reported that girls were 113 grams lighter than the boys. Taha obtained similar results in a study conducted in Saudi Arabia [17]. In a study by al-Awadi [18] in Kuwait, mean birth weight of male infants (3.51 kg) was higher than that of the females (3.47 kg) and in Israel [21], male had mean birth weight of 3.24 kg and female 3.12 kg. In a study in Casablanca (Africa) [22], it was found that male babies weighed 138 gram more than the female. Madebo [23] in Ethiopia found similar results where boys had an average weight of 3.32 kg and girls had 3.14 kg.

The mean birth weight of socioeconomic group 1 was higher than that of group 2. Similar results were obtained by Ahmed et al [24] who reported that the average birth weight of the babies born to the mothers of

upper social class was more than that of middle and lower social class. Similar results were also found in a study in an African country [22], where it was found that babies of the mothers of higher socioeconomic group had average birth weight of 3.39 kg and that of lower group had 3.07 kg.

There was not much difference in the mean birth weights of babies born to the mothers with different parities where as the literature suggests that parity [10] does affect the birth weight and primipara and grand multipara have relatively low birth weight as compared to the multipara [12,18].

This data is comparable with the data of other developing countries. However this study is based on the hospital data and covers only a selected population. Community based studies are needed to establish the true pattern of birth weight of our country as the hospital data may be biased. The birth weight of babies can be improved and hence the neonatal and infant mortality can be reduced by looking after their mothers, providing them with balanced diet and better health care facilities especially antenatal care.

## CONCLUSION

This study shows that majority of analyzed population has normal birth weight; however the value of low birth weight group is still higher than the recommended figure for developing countries. Male neonates and babies of higher socioeconomic group were relatively heavier. Parity however did not have any significant effect on the birth weight.

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