

## THE BIRTH WEIGHT & RELATED FACTORS

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The birth weight of new born in developing countries is substantially less than in the developed countries. The birth weight is an important point for consideration in estimating the health and maturity of the new born. It is an important obstetrical consideration as regards its influence on perinatal and maternal morbidity and mortality. It will be interesting to note that the largest child on record was 23 lbs. born to Anna Siron, the Giantess in 1886. Morill in the same year described another fetus weighing 16½ lbs., which was extracted dead of a mother weighing 200 lbs.

The present study deals with the birth weight and its relationship with certain maternal and fetal factors.

### Material and Method

This study includes 200 cases divided into two groups:

1. Normal Pre-term, term and post-term deliveries.

2. Abnormal pregnancies included the cases with obstetric or medical complications.

*Birth Weight of Baby:* Birth weight of baby tended to increase with the ad-

vancement of pregnancy. Absolute mean birth weight increased continuously with the increased duration of pregnancy until term.

The mean birth weight obtained at 40th week was 3105 gms. the maximum and minimum values being 3630 gms. and 2501 gms. respectively. The average term birth weight was calculated to be 2870 gms. when babies of 38th, 39th and 40th week were taken into consideration (Table I). The largest baby recorded

TABLE I  
*Mean Birth Weight in Pre-term, Term and Post-Dated Pregnancies*

Duration of pregnancy (weeks)	No. of cases	Mean birth weight (gms)
32	3	1560
33	2	1715
34	7	1888
35	3	1817
36	7	1978
37	3	2102
38	51	2702
39	29	2805
40	20	3105
41	1	3860
42	2	3175

during this study was 4090 gms. born of diabetic mother. The maternal and fetal factors influencing the fetal weight were as follows:

*Sex of Baby:* Table II shows that the birth weight of the baby tended to be

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TABLE II  
Mean Birth Weight According to Sex and Gestation

Period of gestation (weeks)	No. of Male cases	Birth weight of male baby (gms)	No. of Female cases	Birth weight of female baby (gms)
32	1	1650	2	1515
33	1	1420	1	2010
34	4	1907	3	1872
35	1	1890	3	1744
36	5	1987	5	1963
37	2	2140	2	2065
38	28	2730	23	2674
39	13	2830	16	2780
40	11	3135	9	3075
41	0	—	1	3860
42	1	3200	1	2960

slightly greater in male babies than female ones of similar gestational age, though this trend was not so regular and some obvious discrepancies had been noticed in the earlier weeks of pregnancy and after term. The mean term birth weight for male babies was 2965 gms. and for female babies 2843 gms.

*Maternal Age:* Table III shows a regular increase in the birth weight of the baby as the maternal age increased.

TABLE III  
Mean Birth Weight at 38 Weeks of Gestation by Maternal Age

Maternal Age in years	No. of cases	Mean birth weight (gms.)
16-20	7	2530
21-25	12	2615
26-30	10	2835
31-35	16	2995
36-40	5	3183
41-45	1	3875

*Maternal Weight and Height:* The body weight of pregnant mothers ranged from 38 kgs. to 69 kgs. and height from 118 cms. to 169 cms. The mean birth weight of the baby increased with the increase in the maternal body weight but

no definite relationship was obtained with the height of the pregnant women.

*Maternal Socioeconomic Condition:* Table IV illustrates that a definite rela-

TABLE IV  
Mean Birth Weight at 38 Weeks of Gestation by Maternal Socio-Economic Status

Maternal Socio-economic status	No. of cases	Mean birth weight (gms.)
Lower Class	28	2583
Middle Class	13	2705
Higher Class	10	2818

tionship existed between maternal nutrition and the growth of the fetus. It increased in weight with the improvement of socioeconomic condition of the pregnant women.

*The Effect of Parity:* In spite of some discrepancies in earlier weeks fetal weight tended to be slightly greater in multipara than in first birth. There was almost a continuous increase in the birth weight with increasing parity. The mean birth weight obtained at 38th week of pregnancy was 2620 gms. for primipara, 2712 gms. for second para and 2774 gms. for multiparas.

*Abnormal Pregnancy Cases:* Study of preivable gestation cases (22 to 28 weeks) showed that fetus was about 3 times the weight of the placenta at 22 weeks of gestation.

*Toxaemia of Pregnancy:* Study of birth weight showed that mean birth weight in toxaemic group was appreciably lower than that of normal cases in corresponding weeks.

Apart from toxaemia of pregnancy, the other cases included under this heading did not show any alteration from the normal values.

#### Discussion

It is known that placental weight varies with the fetal weight and a definite ratio exists between them throughout the period of gestation. Appreciation of facts has led us to establish the standard values of fetal weight and their related factors in normal pregnancy and their aberration, if any, in the abnormal pregnancy.

Birth weight of the baby tended to be slightly greater in males than in females at the similar weeks of gestation, but the trend was found to be regular only during 37th to 40th weeks. This discrepancy might be due to wide variation in weight in isolated cases. Whatever may be the mechanism it does not appear to be specific to the fetal environment since male continues to grow faster than female for about a year after birth. At one year of age males are about 500 gms. heavier than females on an average.

The relationship of fetal weight to parity is somewhat controversial. Murphy and Mulcahy 1971 that there occurs a slight rise in the average birth weight of the babies with increased parity in the lower parity group; thereafter no trend is apparent. Camilleria Cremona 1970 clearly stressed that there

is well recognised increase in weight between first and second births and there is a definite but small and continuous increase of birth weights with atleast upto parity 10.

In this series inspite of some discrepancies in earlier weeks fetal weight tended to be slightly greater in multiparous than in first birth and there was almost a continuous increase in the birth weight with increasing parity. The disparity in the views regarding fetal weights in higher parity groups is probably due to selection of mothers. The mothers of higher parity usually belong to lower socio economic group and who perhaps due to poor nutrition tend to have lighter babies. It is possible that maternal metabolism may change with parity. As an example incidence of diabetes rises. Alternatively, there may be a progressive enlargement of uterine blood supply which could improve the growth.

As the multiparous women usually belong to the higher age group, an increase in the fetal weight is expected. A regular increase in birth weight was also noted with progress of maternal age in this series. But Murphy and Mulcahy (1971) noted a reduction in weight in babies born to mothers over 35 years of age. The effect of prenatal status of mother on birth weight of her child is again a controversial subject. The prenatal status includes maternal size i.e. height and weight, her nutrition and socio economic condition. The nutrition of pregnant women without any doubt an important factor in fetal development and large size of fetus is an indication of health and well being of mother during pregnancy. Gruenwald and Minh (1961) established a prominent influence of the environment on the fetal growth. Undernourished mothers have smaller babies, but under-

nutrition should be differentiated for malnutrition in which the total caloric intake may be adequate or even excessive but in which there may be serious deficiencies of specific nutrient or excess of harmful materials such as oxidised lipids.

Thomson *et al* (1968) correlated maternal height and weight with the fetal weight and showed that babies of short and light primipara delivering near term are an average about 0.7 kg. lighter than in tall and heavy primipara. In the present observation premature labour was common in short mothers.

The congenital uterine environment present in a tall, well nourished mother probably influences the formation of a well functioning placenta which on the other hand helps in the better development of the fetus.

*Abnormal Pregnancy:* In this section discussion is being made on the abnormal pregnancies and their effects on fetal weight.

*Toxaemias of Pregnancy:* It is said that both the fetus and the placenta of the woman with toxaemia of pregnancy weighed less than does the product of conception of a non-toxaemic pregnancy at equivalent week of gestation and these women tend to deliver earlier than does the woman without toxaemia (Thomson *et al* 1968; Chakravorty 1967). But others believed that this reduction in birth weight occurs only in earlier gestation before 36 weeks; the average birth weight is more pronounced in the presence of appreciable proteinuria and when the systolic and diastolic B.P. rises above 160 mm and 110 mm respectively. In this series it is evident that the mean fetal weight in toxaemic group was apparently lower than that of normal case in corresponding weeks. The present study

indicates that the toxaemic process effects both fetal and placental growth but the effect is more pronounced in the former one.

*Antepartum Haemorrhage:* Fetal weight showed no significant difference from the normal. Thomson *et al* (1968) also confirmed this observation. A number of authors have put forward their contraversial view regarding the effect of anaemia on the fetus. Beischer *et al* (1970), and Achari (1971) showed increased evidence of prematurity, still birth and neonatal death, defective intra-uterine growth, brain damage and mental retardation etc. in cases with severe anaemia in pregnancy. Few are of opinion that it does not effect the fetal weight to a great extent.

*Diabetes:* In this series only two cases of diabetic mothers were studied. The male child born of the second mother was largest in the series i.e. 4090 gms.

In this series no case had shown severe effect of Rh incompatibility or Jaundice; the value of fetal weight did not show any appreciable variation from normal values. Such was the case with Heart disease with pregnancy.

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