

Changing Trends in Birth Weight

Devinder Kaur, Amrit Pal Kaur, Rashmi

Department of Obstetrics and Gynaecology, Medical College, Amritsar.

Summary

One Thousand babies born consecutively at S.G.T.B. Hospital, Amritsar with known gestational age, were studied to determine the influence of selected maternal factors on the birth weight. Average birth weight in the present study was 3.092 kgs. 63.2% of the mothers were having complications as toxemia, anemia, antepartum hemorrhage, jaundice, heart disease, previous caesarean sections, Rh incompatibility, multiple gestation while 36.8% constituted the normal pregnancies. The incidence of LBW babies (<2500 gms) was 16.3% and it was significantly associated with low maternal age, severe toxemia, anemia, APII heart disease. No significant association was seen with previous abortions, previous uterine scars, malpresentation, nulliparity, Rh isoimmunization while large for date babies were significantly associated with diabetes and polyhydramnios.

Introduction

Birth weight of an infant reflects the state of mothers health, not only when she has borne the said infant in her womb but even before it. In both developed and developing countries, an infant's birth weight is probably the single most important factor affecting neonatal mortality and morbidity.

The influence of maternal factors on the offspring has been well documented. Thus, maternal biological factors such as age, parity, weight and height and pregnancy complications such as toxemia, anemia and chronic illness have all been recorded to cause low birth weight babies. The marked variability of birth weight in different countries and even in different parts of same country is due to the variation in these maternal factors and varied prevalence of complication.

SGTB Hospital is a tertiary care centre at Amritsar catering to the health needs of Amritsar district and the neighbouring areas of Punjab, which is the richest state in the country. This study results, obtained from the richer socio-economic strata are likely to be more representative of true potentials of our population, and recognition of influence of various maternal factors on pregnancy outcome may help us to improve the planning of prenatal care for Indian women and of the anticipatory care for our infants of "New Millennium"

Material and Method

The present study was conducted on 1000 babies delivered at SGTB Hospital Amritsar at, before or after term between March 1998 to May 1999. Cases with macerated still births and major lethal congenital anomalies were excluded. So were the cases where the

mother was not sure of her dates or there was discrepancy of gestational age clinically. Birth weight of all infants was recorded under similar conditions and statistically analysed regarding incidence of low birth weight and variation of birth weight with various maternal factors.

Observations

Table I shows the distribution of cases in the present study. Overlapping of diseases associated with pregnancy was seen in 93 cases.

The average birth weight in the present study was 3.092 kg. In the normal cases it was 3.498 kg and in cases associated with medical or obstetrical disorders, it was 2.852 kgs.

Table II & III show the age wise and parity wise distribution of birth weight in normal cases and high risk pregnancies respectively. There is an increasing trend in birth weight with increasing age as well as parity and babies born to mothers in absence of any complication weighed heavier for same age and parity.

Table IV shows that incidence of low birth weight babies in different age groups. There was a significant association of LBW babies with mothers of

age less than 20 years. Such association could not be elicited in primipara females, though grand multipara did show a significant association.

Table-V depicts the distribution of birth weight in different socio-economic groups. A higher incidence of high risk pregnancies and low birth weight was obvious in lower socio-economic classes. The correlation was highly significant. Maximum (42%) of cases were of upper middle class and only 7.2% were having per capita monthly income of less than Rs.50/-

Table VI reveals the rewards of antenatal care in terms of good perinatal outcome. Ratio of booked to unbooked patients was 1.8 : 1, signifying greater awareness among population today.

Effect of fetal sex on birth weight is shown in Table VII. Male babies were weighing 329 gms more on an average than female babies. Sex ratio in present study was 1.25 : 1, and calls for a look into the matter of increasing female foeticide.

Short women typically have smaller children (Table VIII). Table IX shows the relation of associated complications of pregnancy with birth weight. As is evident from here, we see a significant association of

Table I: Incidence of Associated Complications

| | | |
|---------------------------------------|---------------|------|
| Total number of cases | | 1000 |
| Normal | | 368 |
| Associated complications of pregnancy | | 632 |
| Anaemia | 56 | |
| Toxaemia | 154 | |
| PET | 142 | |
| Eclampsia | 12 | |
| Antepartum haemorrhage | 48 | |
| Rh isoimmunization | 40 | |
| Previous caesarean section | 240 | |
| Oligohydramnios | 16 | |
| Polyhydramnios | 4 | |
| Previous ectopics | 4 | |
| Malpresentation | 48 | |
| Twins | 40 (20 pairs) | |
| Gestational & Insulin dependant DM | 8 | |
| IUGR | 16 | |
| Fibroid uterus | 8 | |
| Jaundice | 8 | |
| Heart Disease | 8 | |
| Polio affected | 8 | |
| Short statured | 8 | |
| Precious pregnancy | 4 | |
| Previous hysterotomy | 2 | |
| Cervical stitch | 4 | |
| Epilepsy | 1 | |

Table II : Parity and Age Group wise distribution and mean birth weights in normal cases.

| Parity | Age (Years) | | | | |
|------------|-------------|-------|-------|-------|-------|
| | < 20 | 21-25 | 26-30 | 31-35 | > 35 |
| P1 | | | | | |
| No. | 36 | 120 | 36 | - | - |
| Mean BW | 3.224 | 3.419 | 3.468 | | |
| SD | 0.547 | 0.484 | 0.330 | | |
| P2 | | | | | |
| No. | 4 | 36 | 16 | 8 | - |
| Mean BW | 3.375 | 3.393 | 3.581 | 3.837 | |
| SD | 0.104 | 0.474 | 0.469 | 0.372 | |
| P3 | | | | | |
| No. | - | 24 | 28 | 8 | - |
| Mean BW | | 3.415 | 3.632 | 4.244 | |
| SD | | 0.504 | 0.375 | 0.352 | |
| P4 | | | | | |
| No. | - | 4 | 16 | 16 | - |
| Mean BW | | 4.150 | 3.419 | 4.100 | |
| SD | | 0.000 | 0.689 | 0.518 | |
| P5 & above | | | | | |
| No. | - | 4 | 4 | 4 | 4 |
| Mean BW | | 4.000 | 2.663 | 4.000 | 3.824 |
| SD | | 0.000 | 0.825 | 0.000 | 0.150 |

Table III : Parity and Age Group wise Distribution and Mean Birth Weights in High Risk Pregnancies.

| Parity | Age (years) | | | | |
|------------|-------------|-------|---------|---------|-------|
| | < 20 | 21-25 | 26 - 30 | 31 - 35 | > 35 |
| P1 | | | | | |
| No. | 52 | 112 | 20 | 4 | - |
| Mean BW | 2.350 | 2.753 | 2.975 | 2.500 | |
| SD | 0.795 | 0.620 | 0.594 | 0.000 | |
| P2 | | | | | |
| No. | 24 | 116 | 72 | 12 | 4 |
| Mean BW | 2.733 | 3.000 | 3.219 | 2.567 | 3.900 |
| SD | 0.769 | 0.578 | 0.850 | 0.629 | 0.000 |
| P3 | | | | | |
| No. | 4 | 60 | 60 | 16 | |
| Mean BW | 3.200 | 2.737 | 3.170 | 2.300 | |
| SD | 0.000 | 0.658 | 0.676 | 0.219 | |
| P4 | | | | | |
| No. | - | 16 | 20 | 9 | |
| Mean BW | | 2.650 | 2.837 | 2.375 | |
| SD | | 0.650 | 0.309 | 0.133 | |
| P5 & above | | | | | |
| No. | - | 4 | 24 | 4 | |
| Mean BW | | 4.300 | 2.558 | 2.500 | |
| SD | | 0.000 | 0.552 | 0.000 | |

Table IV : Incidence of LBW Babies in Different Age Groups.

| Age (Years) | Total cases | LBW | Percentage |
|--------------------------|-------------|-----|------------|
| Less than or Equal to 20 | 120 | 40 | 33.33 |
| 21-25 | 496 | 72 | 14.52 |
| 26 - 30 | 296 | 31 | 10.47 |
| 31 - 35 | 80 | 20 | 25.00 |
| > 35 | 8 | - | - |
| Total | 1000 | 163 | 16.30 |

Table V : Distribution of Cases as per Socio - Economic Status.

| Class | Normal | | High risk group | |
|--------------|--------------|------------|-----------------|------------|
| | No. of Cases | Average BW | No. of cases | Average BW |
| Lower | 4 | 2.500 | 68 | 2.229 |
| Lower Middle | 124 | 3.221 | 260 | 2.417 |
| Upper Middle | 184 | 3.603 | 236 | 3.082 |
| Upper | 56 | 3.638 | 68 | 3.741 |

Table VI : Effect of Antenatal Care on Incidence of Low Birth Weight Babies

| | Total | Normal | Any Compl | Average BW | LBW | %age |
|----------|-------|--------|-----------|------------|-----|-------|
| Booked | 648 | 244 | 404 | 3.303 | 55 | 8.49 |
| Unbooked | 352 | 124 | 228 | 2.697 | 108 | 30.68 |

For unbooked cases $p < 0.001$.

Table VII : Effect of Fetal Sex on Incidence of Low Birth Weight Babies.

| | No. of Cases | Average BW | LBW | Percentage |
|--------|--------------|------------|-----|------------|
| Male | 555 | 3.237 | 83 | 14.95 |
| Female | 443 | 2.908 | 80 | 18.06 |

For Fetal Sex, $p > 0.05$

Table VIII : Effect of Maternal Stature on Incidence of LBW Babies.

| Height (in inches) | Total | Average BW | LBW | % age |
|--------------------|-------|------------|-----|-------|
| < 56 | 12 | 1.667 | 8 | 66.67 |
| 56 - 60 | 328 | 2.793 | 83 | 25.30 |
| 61 - 65 | 652 | 3.251 | 72 | 11.04 |
| > 65 | 8 | 4.275 | - | - |

For height < 56", $p < 0.001$.

LBW babies with severe anemia, APH, untreated toxemia, multiple pregnancies, oligohydramnios, IUGR, jaundice and heart disease. There was no association with previous LSCS, malpresentation, Rh - isoimmunisation. Large for date babies were associated with diabetes and polyhydramnios.

Discussion

The average birth weight of 3.092 kg in the present study is very much higher than that in other

parts of the country. Table X (Achar and Yankaner 1962; Mittal, et al 1976).

An improvement in health care system, an awareness in general population towards values of antenatal care and better health of mothers at the onset of reproductive life has helped to improve the birth weight of babies and decrease the perinatal mortality rate. The effect of various maternal factors including pregnancy complications on infants birth weight has remained unchanged.

Table IX : Birth Weight Distribution in High Risk Cases.

| Associated Complication | No. of Cases | Average Birth wt | LBW | Asso. Compl. |
|-------------------------|--------------|------------------|------|--------------|
| P. LSCS | 240 | 2.910 | 16 | - |
| PIH - Pre-eclampsia | 142 | 2.691 | 32 | - |
| Eclampsia | 12 | 2.100 | 12 * | |
| Anaemia | 56 | 2.275 | 32 * | |
| APH | 48 | 2.196 | 44 * | |
| Multiple gestation | 40 | 2.245 | 28 * | |
| Malpresentations | 48 | 2.973 | 8 | |
| RH isoimmunisation | 40 | 3.120 | - | |
| Gestational DM | 8 | 4.600 | - | - |
| Oligohydroamnios | 16 | 2.087 | 12 | IUGR (8)* |
| Polyhydroamnios | 4 | 3.900 | - | - |
| Previous ectopic | 8 | 3.075 | - | |
| Previous hysterotomy | 2 | 2.500 | - | |
| Cervical stitch | 4 | 2.750 | - | |
| Precious Pregnancy | 4 | 4.400 | - | |
| IUGR | 16 | 1.787 | 16 * | |
| Fibroid Uterus | 8 | 3.400 | - | |
| Jaundice | 8 | 2.825 | 4 * | |
| Polio affected | 8 | 2.950 | - | |
| Short Stature | 8 | 1250 | 8 * | |
| Epilepsy | 1 | 2.000 | 1 * | |
| Heart disease | 8 | | 8 * | |

* p < 0.001.

Table X : Comparing Birth Weights in Different Cities of India.

| | | Birth wt Gms. |
|---|------------|---------------|
| Indian infants in Madras (Achar, 1962) | Poor | 2736 |
| | Well to do | 2948 - 3118 |
| Indian infants in Calcutta | | 2610 |
| Indian infants in Delhi | Poor | 2780 |
| | Well to do | 2950 |
| Indian infants in Ludhiana (Mittal et al, 1976) | | 2974 |
| Present study | | 3092 |

The incidence of LBW babies in present study was only 16.3%. A higher incidence of LBW infants viz (26.8%) was observed by Khatua et al (1979) and viz. 24.5% by Mittal et. al (1976) taking a cut off of 2500 gms.

The male to female ratio has increased from 1.16 :1 (Khatua et al 1979) to 1.25 : 1, with male weighing more than females.

The association with various risk factors was in accordance with that of other studies Bhargava et al (1973); Fedrick & Adelstem (1978); Kruger et al, (1996), Verries et al, (1993) with minor variations. The predictive value of these associations were limited, but their recognition may improve the planning of prenatal care for Punjabi women and of the anticipatory care for their infants.

Reference

1. Achar ST ; Yankauer A : Ind. J. Child Health: 11; 4, 157, 1962.
2. Bhargava SK ; Bhargava V ; Madhavan S ; Ghosh S : Ind. Pediatr. 10: 161, 1973.
3. Fedrick J ; Adelstein P : Brit. J. Obstet. Gynaec. 85: 1, 1978.
4. Khatua SP ; Manocha BK ; Chatterjee S ; Palodhi PKR : Ind. Pediatr 16: 5, 395, 1979.
5. Kruger N ; Kurth D ; Dietz G ; Kruger I : Zentralbl. Gynakol. 118: 232, 1996
6. Mittal SK ; Singh PA ; Gupta RC : Ind. Pediatr. 13: 9, 679, 1976.
7. Verrier M ; Spears W ; Ying J ; Kerr GR : Tex. Med. 89: 51, 1993.