Research Article

Incidence of low birth weight and associated maternal factors

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Abstract

Background: The major and primary determinant of birth weight is of course the gestational age, but there are other secondary factors which also bear, either directly or indirectly, on birth weight. These are maternal age, maternal height, maternal education, socio-economic factors and parity. Present study was done to find out the average birth weight, the incidence of low birth weight newborn babies in the study population and the associated maternal factors. **Methods:** It is a hospital based prospective study. Study duration was from 14-10-1993 to 30-10-1994. Target population was women booked at 12 weeks of gestational period and who delivered at hospital during study period. Details regarding age, income, occupation, education, obstetrical history, menstrual history was collected from study subjects. After admission complete general, physical and obstetrical examination was performed and recorded. After the delivery, the newborn baby was weighed, within 30 minutes of the birth, without clothing, on a lever type of weighing machine and weight was recorded in grams. All the above data were recorded and appropriate statistical tests were performed. **Results:** Overall mean birth weight was 2728.9 grams. Incidence of low birth weight i.e. less than 2500 grams was 34.6%. Mean birth weight increased with increase in maternal age. Highly significant association was observed between birth weight and maternal height, maternal education, maternal socioeconomic status and parity. **Conclusion:** Incidence of low birth weight was 34.6%. Mean birth weight of the baby was found to be associated maternal age, maternal height, maternal education, maternal socioeconomic status and parity.

Keywords: Low birth weight, maternal education, Parity.

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INTRODUCTION

The major and primary determinant of birth weight is of course the gestational age, but there are other secondary factors which also bear, either directly or indirectly, on birth weight. These are maternal age, maternal height, maternal education, socio-economic factors and parity[1-4]. Present study was done to find out the average birth weight, the incidence of low birth weight newborn babies in the study population and the associated maternal factors.

METHODS

It is a hospital based prospective study conducted at the Department of Obstetrics and Gynaecology of the Government Medical College and Hospital, Nagpur. Study duration was from 14-10-1993 to 30-10-1994. Target population was women booked at 12 weeks of gestational period and who delivered at the hospital during the study period. The patients able enough to state the exact date of the last menstrual period were only taken-up in the study group. The gestational period was calculated from the first day of the last menstrual period. Detailed information regarding age, income, occupation, education, obstetrical history, menstrual history and other information quoted in the proforma, were collected from study subjects. After admission to labour ward, a detailed history, complete general, physical examination and obstetrical examination were performed and recorded. Gestational age was assigned by the obstetrician, delivering the women on the basis of the best estimate from menstrual data, physical examination i.e. uterine size measurements in weeks, and ultrasound was done, whenever needed for confirmation of gestational age. After the delivery, the newborn baby was weighed, within 30 minutes of the birth, without clothing, on a lever type of weighing machine and weight was recorded in grams. The statistical test of significance X^2 was performed for

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categorical variables like age, education, parity, height, socio-economic status of the mother.

RESULTS

Overall mean birth weight was 2728.9 grams. Incidence of low birth weight i.e. less than 2500 grams was 34.6%. Mean birth weight increased with increase in maternal age. Highly significant association was observed between birth weight and maternal height, maternal education, maternal socioeconomic status and parity. For all tables, Figure in Parenthesis indicates percentages to row totals.

Table 1: Distribution According to Maternal age and Birth Weight

Age of mothers in years	Birth Weight (grams)					Mean Birth Weight (gms)	Std dev
	<2500	2501-3000	3001-3500	< 3501	Total		
< 20	25 31.64 %	54 68.36 %	0 0 %	0 0 %	79 100%	2657.5	237.5
21-25	128 39.88 %	147 45.80 %	44 13.70 %	2 0.62%	321 100%	27.4.1	332.3
26-30	20 23.52 %	51 60.0 %	5 5.88 %	9 10.60%	85 100%	2825.6	403.1
31-35	0 0 %	10 66.66 %	0 0 %	5 33.34%	15 100%	3080.0	496.0
Total	173 34.6 %	262 52.4 %	49 4.9 %	16 3.2%	500 100%	2728.9	347.2

χ^2=100.8; df=9; p<0.00001

Table 2: Distribution According to the Weight of the mother and birth Weight

Maternal height (cm)	Birth Weight (grams)					Mean Birth Weight (grams)	Std dev
	<2500	2501-3000	3001-3500	< 3501	Total		
<140	5 25.0 %	15 75.0 %	0 0 %	0 0 %	20 100%	2652.5	259.6
141-145	49 44.54 %	51 46.36 %	10 9.10 %	0 0%	110 100%	2665.5	286.0
146-150	109 45.22 %	111 46.6 %	15 6.22 %	6 2.50%	241 100%	2669.5	334.5
151-155	5 5.88 %	56 65.88 %	14 16.48 %	10 11.76%	85 100%	2867.5	270.6
156-160	5 12.82 %	29 74.36 %	5 12.82 %	0 0%	39 100%	2891.0	378.9
161-165	0 0 %	0 0 %	5 12.82 %	0 0 %	39 100%	3330.0	156.5
Total	**173 34.6 %**	**262 52.4 %**	**49 9.8 %**	**16 3.2%**	**500 100%**	**2728.9**	**347.2**

χ^2=100.8; df=9; p<0.00001

Table 3: Distribution According to Education of Mother and Birth Weight

Meternal education	Birth Weight (grams)					Mean Birth Weight (grams)	Std dev
	<2500	2501-3000	3001-3500	< 3501	Total		
Illiterate	1 9.10 %	10 90.90 %	0 0 %	0 0 %	11 100%	2651.7	277.8
Primary	33 60.0 %	22 40 %	0 0 %	0 0%	55 100%	2663.4	239.0
Secondary	99 38.22 %	140 54.06 %	20 7.72 %	0 0%	259 100%	2672.5	289.2
Higher secondary	35 22.58 %	80 51.62 %	5 15.48 %	16 10.32%	155 100%	2872.6	423.3
Graduation and above	5 25 %	10 50 %	5 25 %	0 0%	20 100%	2795.0	280.9
Total	**173 34.6 %**	**262 52.4 %**	**49 9.8 %**	**16 3.2%**	**500 100%**	**2728.9**	**347.2**

χ^2=100.8;df=9; p<0.00001

Table 4: Distribution According to socio-economic Status of mother and Birth Weight

Socioeconomic status of mothers by modified Kuppuswamy's classification		Birth Weight (grams)					Mean Birth Weight (grams)	Std dev
		<2500	2501-3000	3001-3500	< 3501	Total		
Upper	Upper	0 0 %	7 100 %	0 0 %	0 0 %	7 100%	2791.0	66.5
Middle	Upper Middle	2 5.71 %	19 54.30 %	10 28.57 %	4 11.42%	35 100%	3000.0	374.4
	Lower Middle	51 37.23 %	70 51.10 %	11 8.02 %	5 3.65%	137 100%	2802.5	334.4
Lower	Upper lower	119 37.20 %	166 51.87 %	28 8.75 %	7 2.18%	320 100%	2711.8	341.1
	Lower	1 100 %	0 0 %	0 0 %	0 0%	1 100%	2250.0	---
Total		**173 34.6 %**	**262 52.4 %**	**49 9.8 %**	**16 3.2%**	**500 100%**	**2728.9**	**347.2**

χ^2=100.8;df=9; p<0.00001

Table 5: Distribution according to Parity and Birth Weight

Parity	Birth Weight (grams)					Mean Birth Weight (grams)	Std dev
	<2500	2501-3000	3001-3500	< 3501	Total		
1	99 42.68 %	123 53.01 %	10 4.31 %	0 0 %	232 100%	2631.6	275.7
2	55 29.90 %	112 60.86 %	17 9.24 %	0 0%	184 100%	2723.2	276.1
3	19 32.22 %	21 35.59 %	18 30.50 %	1 1.69%	59 100%	2836.7	400.6
4	0 0%	5 25 %	4 20 %	11 55%	20 100%	3397.5	441.4
5	0 0%	1 20 %	0 0%	4 80%	5 100%	3520.0	370.1
Total	**173 34.6 %**	**262 52.4 %**	**49 9.8 %**	**16 3.2%**	**500 100%**	**2728.9**	**347.2**

χ^2=100.8; df=9; p<0.00001

DISCUSSION

In the present study, it was observed that mean birth weight of the baby was associated with maternal age, maternal height, maternal education, maternal socioeconomic status and parity. Tiwari Priyamvada *et al* [5] in 1977 found that the mean birth weight (at 38 weeks of gestation) increased, with the increase in m aternal age up to 45 years. Our findings were consistent with the study of Makhija. K. *et al* [6] 1989 and the findings were also consistent with the study of Ghosh. S [4] *et al* 1977. In our study, the incidence of babies with birth weight < 2500 grams was almost the same in lower middle and upper lower class but significantly lower in upper middle and upper class of women. This finding was similar to the study of Ghosh, s, *et al* [4] 1977, except the stratification of income groups, which was done in three groups in their study and five groups in our study, and that could give a variation in birth weight. Our study has limitations of an observational study design. Further robust and longitudinal studies in large sample of population and different centres need to be done to further the knowledge on the subject.

CONCLUSION

Incidence of low birth weight was 34.6%. Mean birth weight of the baby was found to be associated maternal age, maternal height, maternal education, maternal socioeconomic status and parity.

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