

## Original Research Article

# Low birth weight and its sociodemographic correlates: a descriptive study from medical college hospital, Maharashtra

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## ABSTRACT

**Background:** Low birth weight is one of the most serious challenges in maternal and child health in both developed and developing countries. According to a UNICEF report about 28 per cent of babies born in India are low birth weight. Present hospital based study was undertaken to estimate the proportion of babies with low birth weight.

**Methods:** The present hospital based descriptive study was conducted at Swami Ramanand Teerth Rural Govt. Medical College and Hospital. The data collection was done during 1<sup>st</sup> March 2012 to 28<sup>th</sup> February 2013. All deliveries occurring on alternate days were included in the study which comes to, 1154 deliveries.

**Results:** Out of total 1154 live full term new borns; 279 (24.18%) were low birth weight babies. The percentage of low birth weight babies was more in mothers from rural area 243 (27.46%). Highest percentage (45.33%) of low birth weight babies was seen in non agricultural laborer. Higher percentage of low birth weight babies (26.18%) was observed among mothers belonging to joint family. Highest percentage (28.61%) of low birth weight babies was observed in class V socioeconomic status.

**Conclusions:** Baby birth weight has significant association with place of residence, mothers occupation, fathers occupation, socioeconomic status of family ( $p < 0.05$ ).

**Keywords:** Low birth weight, Sociodemography, Maharashtra

## INTRODUCTION

Low birth weight is one of the most serious challenges in maternal and child health in both developed and developing countries. Its public health significance may be ascribed to numerous factors like its high incidence, its association with mental retardation and high risk of perinatal and infant mortality and morbidity, human wastage and suffering, the very high cost of special care and intensive care unit and its association with socioeconomic underdevelopment.<sup>1</sup>

By International agreement, low birth weight has been defined as a birth weight of less than 2.5 kg (up to and including 2499 grams) the measurement being taken preferably within the first hour of life, before significant weight loss has occurred.<sup>1</sup>

According to a UNICEF report, about 28 per cent of babies born in India are low birth weight.<sup>2</sup> In Maharashtra, over 28% of newborns are born with low birth weight.<sup>3</sup> Present hospital based study was undertaken to estimate the proportion of babies with low birth weight.

## METHODS

The present hospital based descriptive study was conducted at Swami Ramanand Teerth Rural Govt. Medical College and Hospital. The data collection was done during 1<sup>st</sup> March 2012 to 28<sup>th</sup> February 2013. The study subjects comprised of postnatal mothers having full term normal delivery with single ton live born baby delivered during the study period. Multiple births, preterm births, still births and those PNC cases who did not give consent for study were excluded.

The sample size was calculated by using the formula  $n=4pq/L2$ .<sup>4</sup>

So, based on national incidence of low birth weight 28% sample size at 95% confidence level with 10% allowable error will be 1029. Present study being hospital based, 50% of the deliveries occurring during the study period were included. Therefore all deliveries occurring on alternate days were included in the study which comes to, 1154 deliveries.

Approval from the Institutional Ethical Committee (IEC) was taken before the study. Investigator himself visited PNC ward on alternate days during study period, by interviewing and examining mothers, data was collected in predesigned pretested proforma. Also available record of the mothers including antenatal record was scrutinized.

By international agreement, low birth weight has been defined as a birth weight less than 2.5 kg (up to and including 2499 grams), the measurement being taken preferably within the first hour of life, before significant weight loss has occurred.<sup>1</sup>

Data thus collected was entered in MS excel sheet. Statistical analysis was done by using percentages and Chi square test. Open Epi software was used for calculation of Chi square test and p-value.

## RESULTS

Out of total 1154 live full term new borns; 279 (24.18%) were low birth weight babies whereas 875 (75.82%) were normal birth weight babies. In the present study the proportion of low birth weight babies was 24.18%.

**Table 1: Distribution of new borns according to birth weight.**

| Birth weight                       | Number of new borns | Percentage (%) |
|------------------------------------|---------------------|----------------|
| New borns with normal birth weight | 875                 | 75.82          |
| New borns with low birth weight    | 279                 | 24.18          |
| Total                              | 1154                | 100            |

Maximum number of mothers i.e. 885 belonged to rural area than urban area i.e. 269. The percentage of low birth weight babies was more in mothers from rural area 243 (27.46%) than urban 36 (13.38%). Highly significant association was observed between place of residence and birth weight of baby ( $p<0.001$ ).

**Table 2: Distribution of new borns according to birth weight and place of residence.**

| Place of residence | Normal birth weight | Low birth weight | Total      |
|--------------------|---------------------|------------------|------------|
|                    | N (%)               | N (%)            | N (%)      |
| Rural              | 642 (72.54)         | 243 (27.46)      | 885 (100)  |
| Urban              | 233 (86.62)         | 36 (13.38)       | 269 (100)  |
| Total              | 875 (75.82)         | 279 (24.18)      | 1154 (100) |

Figures in parenthesis indicate row percentage;  $X^2=22.29$ , Df=1,  $p<0.001$ .

Out of 1154 mothers, maximum number of mothers i.e. 669 was house wives followed by 302 agricultural laborers, 150 non agricultural laborers, 22 were in service and 11 were involved in other occupations.

**Table 3: Distribution of new borns according to birth weight and occupation of mother.**

| Occupation of mother     | Normal birth weight | Low birth weight | Total      |
|--------------------------|---------------------|------------------|------------|
|                          | N (%)               | N (%)            | N (%)      |
| Housewife                | 546 (81.61)         | 123 (18.39)      | 669 (100)  |
| Agricultural laborer     | 219 (72.52)         | 83 (27.48)       | 302 (100)  |
| Non-agricultural laborer | 82 (54.67)          | 68 (45.33)       | 150 (100)  |
| Service                  | 19 (86.36)          | 3 (13.64)        | 22 (100)   |
| Others                   | 9 (81.82)           | 2 (18.18)        | 11 (100)   |
| Total                    | 875 (75.82)         | 279 (24.18)      | 1154 (100) |

Figures in parenthesis indicate row percentage;  $X^2=52.21$ , Df=4,  $p<0.001$ .

Highest percentage (45.33%) of low birth weight babies was seen in non agricultural laborer. While lowest percentage (13.64%) of low birth weight babies was seen in mothers having service.

Highly significant association was observed between mothers occupation and birth weight of baby ( $p<0.001$ ).

Out of 1154 fathers, maximum number of fathers i.e. 593 were agricultural laborers followed by 338 non agricultural laborer, 119 were in own business, 74 in service and 30 were in other occupations. Highest percentage i.e. 36.69% of low birth weight babies was seen among non agricultural laborer followed by agricultural laborer i.e. 19.90% and lowest percentage i.e. 14.86% of low birth weight babies was seen among fathers having service.

**Table 4: Distribution of new borns according to birth weight and occupation of father.**

| Occupation of father            | Normal birth weight | Low birth weight | Total      |
|---------------------------------|---------------------|------------------|------------|
|                                 | N (%)               | N (%)            | N (%)      |
| <b>Agricultural laborer</b>     | 475 (80.10)         | 118 (19.90)      | 593 (100)  |
| <b>Non-agricultural laborer</b> | 214 (63.31)         | 124 (36.69)      | 338 (100)  |
| <b>Own business</b>             | 98 (82.35)          | 21 (17.65)       | 119 (100)  |
| <b>Service</b>                  | 63 (85.14)          | 11 (14.86)       | 74 (100)   |
| <b>Others</b>                   | 25 (83.33)          | 5 (16.67)        | 30 (100)   |
| <b>Total</b>                    | 875 (75.82)         | 279 (24.18)      | 1154 (100) |

Figures in parenthesis indicate row percentage;  $X^2=41.97$ , Df=4,  $p<0.001$ .

Highly significant association was observed between fathers occupation and birth weight of baby ( $p<0.001$ ).

Out of 1154 mothers, maximum i.e. 741 mothers belonged to joint family, 374 mothers belonged to nuclear family and 39 mothers belonged to three generation family. Higher percentage of low birth weight babies (26.18%) was observed among mothers belonging to joint family and lowest percentage of low birth weight babies (15.38%) was observed among mothers belonging to three generation family.

**Table 5: Distribution of new borns according to birth weight and type of family.**

| Type of family          | Normal birth weight | Low birth weight | Total      |
|-------------------------|---------------------|------------------|------------|
|                         | N (%)               | N (%)            | N (%)      |
| <b>Joint</b>            | 547 (73.82)         | 194 (26.18)      | 741 (100)  |
| <b>Nuclear</b>          | 295 (78.88)         | 79 (21.12)       | 374 (100)  |
| <b>Three generation</b> | 33 (84.62)          | 6 (15.38)        | 39 (100)   |
| <b>Total</b>            | 875 (75.82)         | 279 (24.18)      | 1154 (100) |

Figures in parenthesis indicate row percentage;  $X^2=5.171$ , Df=2,  $p>0.05$ .

No significant association could be revealed between type of family and birth weight of baby ( $p>0.05$ ).

Out of 1154 mothers, maximum i.e. 402 mothers were belonging to class IV, 381 were to class V, 230 mothers belonged to class III, 99 mothers to class II and 42 mothers belonged to class I.

Highest percentage (28.61%) of low birth weight babies was observed in class V socioeconomic status whereas minimum percentage (14.29%) of low birth weight babies was seen in class I socioeconomic status. It is clear from

the table that the percentage of low birth weight babies increases with decrease in socioeconomic status.

**Table 6: Distribution of new borns according to birth weight and socioeconomic status.**

| Socio-economic class | Normal birth weight | Low birth weight | Total      |
|----------------------|---------------------|------------------|------------|
|                      | N (%)               | N (%)            | N (%)      |
| <b>I</b>             | 36 (85.71)          | 6 (14.29)        | 42 (100)   |
| <b>II</b>            | 82 (82.83)          | 17 (17.17)       | 99 (100)   |
| <b>III</b>           | 181 (78.70)         | 49 (21.30)       | 230 (100)  |
| <b>IV</b>            | 304 (75.62)         | 98 (24.38)       | 402 (100)  |
| <b>V</b>             | 272 (71.39)         | 109 (28.61)      | 381 (100)  |
| <b>Total</b>         | 875 (75.82)         | 279 (24.18)      | 1154 (100) |

Figures in parenthesis indicate row percentage.  $X^2=10.02$ , Df=4,  $p<0.05$ .

Significant association was found between socio-economic status and birth weight of baby ( $p<0.05$ ).

## DISCUSSION

In Table 1, out of total 1154 live full term new borns; 279 (24.18%) were low birth weight babies whereas 875 (75.82%) were normal birth weight babies. In the present study the proportion of low birth weight babies was 24.18%.

These findings are in confirmation with, Negi et al observed 23.8%, Ashtekar et al observed 24%, Bortane et al observed 20.5% and Metgud et al observed 22.9% proportion of low birth weight babies.<sup>5-8</sup>

However the present study findings are not in confirmation with, Deshmukh et al who reported 30.3% of low birth weight babies, Biswas et al 31.3% Chaudhary et al 36.2%. This variation may be because the fact that these studies were conducted in urban areas, whereas Prasad et al reported 13.3% of low birth weight babies, Velankar 45.2%, Thomare et al 18.1%. These differences may be attributed to different geographical settings.<sup>9-14</sup>

In Table 2, Maximum number of mothers i.e. 885 belonged to rural area than urban area i.e. 269. The percentage of low birth weight babies was more in mothers from rural area 243 (27.46%) than urban 36 (13.38%). Highly significant association was observed between place of residence and birth weight of baby ( $p<0.001$ ).

These findings are in confirmation with, Nagargoje et al, Padda et al, Agarwal et al.<sup>15-17</sup> However the present study findings are not in confirmation with, Bhargava et al who observed 38.1% among rural cohort had a birth weight of 2500 gm or less compared to 41.4% in urban areas, Balaji et al observed that among the mothers who had newborn

babies with low birth weight, (11.08%) belonged to rural population and 11.84% in peri-urban population, but there was no statistically significant difference.<sup>18,19</sup> This difference is usually attributed to the fact that these studies were conducted in per-urban areas usually identical to slums where the problem of low birth weight and malnutrition is comparatively more than rural area.

In Table 3, out of 1154 mothers, maximum number of others i.e. 669 was house wives followed by 302 agricultural laborers, 150 non agricultural laborer, 22 were in service and 11 were involved in other occupations.

Highest percentage (45.33%) of low birth weight babies was seen in non agricultural laborer. This is because of more physical activity, poor diet and lack of adequate rest. While lowest percentage (13.63%) of low birth weight babies was seen in mothers having service.

Highly significant association was observed between mothers occupation and birth weight of baby ( $p < 0.001$ ). The present study findings are in confirmation with Chaudhary et al, Anand and Garg, Deshpande et al, Kiran bala et al and Shah et al.<sup>11,20-23</sup>

However the present study findings are not in confirmation with, Manna et al who observed the housewives delivered maximum percentage (42.5%) of low birth weight babies as compared to agricultural worker and laborer (26.8%) and which was significant, this was attributed to lower status of women in their society.<sup>24</sup>

In Table 4, out of 1154 fathers, maximum number of fathers i.e. 593 were agricultural laborers followed by 338 non agricultural laborer, 119 were in own business, 74 in service and 30 were involved in other occupations.

Highest percentage i.e. 36.69% of low birth weight babies was seen among non agricultural laborer followed by agricultural laborer i.e. 19.90%. The labor class usually have low wedges, poor purchasing power, poor diet, high physical work, poor access to health services leading to various health problems one of which is low birth weight babies, whereas lowest percentage i.e. 14.86% of low birth weight babies was seen among fathers having service.

Highly significant association was observed between fathers occupation and birth weight of baby ( $p < 0.001$ ). The present study findings are not in confirmation with, Mavalankar et al who observed that husband's occupation was not significantly associated with birth weight of baby.<sup>25</sup>

In Table 5, out of 1154 mothers, maximum i.e. 741 mothers belonged to joint family, 374 mothers belonged to nuclear family and 39 mothers belonged to three generation family.

Higher percentage of low birth weight babies (26.18%) was observed among mothers belonging to joint family and lowest percentage of low birth weight babies (15.38%) was observed among mothers belonging to three generation family.

No significant association could be revealed between type of family and birth weight of baby ( $p > 0.05$ ). The present study findings are in confirmation with Bortane et al, Chaudhary et al and Agarwal et al.<sup>7,11,17</sup>

In Table 6, Out of 1154 mothers, maximum i.e. 402 mothers were belonging to class IV, 381 were to class V, 230 mothers belonged to class III, 99 mothers to class II and 42 mothers belonged to class I.

Highest percentage (28.61%) of low birth weight babies was observed in class V socioeconomic status whereas minimum percentage (14.29%) of low birth weight babies was seen in class I socioeconomic status. It is clear from the table that the percentage of low birth weight babies increases with decrease in socioeconomic status. Higher socioeconomic status is associated with good purchasing power, improved nutritional status, more utilization of available services, higher educational standard and increases awareness about available MCH services.

Significant association was found between socioeconomic status and birth weight of baby ( $p < 0.05$ ). The present study findings are in confirmation with, Deshmukh et al, Biswas et al, Padda et al, Anand and Garg, Gawande et al, Hirve and Ganatra, Joshi and Pai, Khatun and Rahman, and More et al.<sup>9,10,16,20,26-30</sup> Present study findings are not in confirmation with Kramer who observed no increased risk of low birth weight for women of lower socioeconomic status.<sup>31</sup>

## CONCLUSION

The percentage of low birth weight babies was more in mothers from rural area ( $< 0.05$ ). Highest percentage of low birth weight babies was seen in non-agricultural laborer. Baby birth weight has significant association with mothers occupation, fathers occupation, socioeconomic status of family ( $p < 0.05$ ).

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