ABSTRACT

Background: Low birth weight (LBW) has been defined as a birth weight of <2.5 kilogram regardless of gestational age. In India, every 3rd born child is of LBW. LBW is associated with increased neonatal mortality and morbidity, compromised growth and cognitive development.

Methods: This is a retrospective cohort study using previously collected data from January 2015 to December 2015.

Results: Out of 1238 live births, 485 (39.17%) were LBW. 456(94.01%) were LBW weighing >1500 grams (LBW), 22(4.53%) were VLBW, and 07(1.44%) were ELBW. 361(74.43%) were LBW2 (birth weight ≥2000 - <2500 grams), 95(19.58%) were LBW1 (birth weight ≥1500 - <2000 grams). 289(59.58%) of LBW neonates were full term. SNCU admission was significantly higher in LBW neonates (25.8% vs 9.61%). Morbidities were higher in LBW neonates compared to normal birth weight neonates. Difference was more significant in incidence of sepsis (3.72% vs 0.83%), RDS (2.19% vs 0%), TTN (5.48% vs 2.36%), hypoglycemia (1.31% vs 0%), feed intolerance (1.09% vs 0%) and risk of major congenital malformation (1.97% vs 0.27%). Need for respiratory support was 4.82% in LBW vs 2.36% in normal birth weight neonates. Morbidities were significantly higher in VLBW and ELBW neonates. Immediate poor outcome was in 3.92% in LBW neonates, while it was 0.56% in normal weight neonates. Poor immediate outcome was 1.11% in LBW2, 2.10% in LBW1, 10% in VLBW1, 41.66% in VLBW2, and 100% in ELBW.

Conclusions: LBW neonates are at higher risk of morbidities and mortalities. The major determinant for mortality in LBW babies is the birth weight. The best option to prevent LBW is by improving maternal health. Improvement of perinatal and neonatal services in government sector and public private partnership model of free neonatal care can help to achieve the INAP goal of NMR <10 by 2030.

Keywords: Immediate outcome, Low birth weight, Morbidities

INTRODUCTION

Low birth weight has been defined as a birth weight of less than 2.5 kilogram regardless of gestational age (WHO -1960).1

More than 20 million infants worldwide, representing 15.5 percent of all births are born with low birth weight. More than 95 percent of them are born in developing countries. The incidence of low birth weight in developing countries (16.5 per cent) is more than double the incidence in developed regions (7 per cent). In India, nearly 8 million babies are born with a low birth weight every year.2 In India, every 3rd born child is of a low birth weight.3 Birth weight is a strong indicator not only of a mother’s health and nutritional status but also a newborn’s chances for survival, growth and long-term health. VLBW and ELBW neonates are of major concern because of maximum perinatal mortality found in this group4.
Current neonatal mortality in India is 29 in 2013. Three fourth of neonatal deaths occur among low birth weight newborns. India Newborn Action Plan (INAP) was started on September 18th 2014 with goal of NMR less than 10 by 2030.

Currently nationwide data on neonatal morbidity and mortality in LBW babies are scares, more so in backward areas of Gujarat state like Waghodia taluka. Hence, we conducted this study. Another purpose was to evaluate the mortality and morbidity of LBW in this existing set up so that appropriate corrective measures can be taken to improve the outcome.

METHODS

This is a retrospective cohort study using previously collected data from neonates born at Dhiraj Hospital, Piparia, Vadodara district, Gujarat, India between January 2015 to December 2015.

These neonates were examined, monitored and managed by standard protocols. Nude weight of neonate at birth is taken by electronic weighing scale having ±1 gram accuracy. Gestational age is calculated using last menstrual period and new Ballard score.

Neonates with birth weight of less than 2500 grams are classified as low birth weight (LBW), with birth weight of between ≥2500-<3500 grams as normal birth weight (NBW), and with birth weight of ≥3500 grams as large birth weight (LaBW). Low birth weight neonates were further classified as low birth weight (birth weight ≥1500 grams - <2500 grams), very low birth weight (VLBW) with birth weight of ≥1000-<1500 grams, and extremely low birth weight (ELBW) with birth weight of < 1000 grams.

For further analysis, low birth weight neonates were sub classified as LBW1 (birth weight of ≥1500-<2000 grams) and LBW2 (birth weight of ≥2000-<2500 grams). LBW1 were further classified as LBW1a (birth weight of between ≥1500 grams-<1800 grams) and LBW1b (birth weight of ≥1800 grams-<2000 grams). All the neonates were analyzed for morbidities and immediate outcome. There morbidities and outcome were compared. This study is a retrospective analysis of previously collected information. Neonates were managed by standard protocols. This study was approved by the hospital ethics committee.

RESULTS

718 (57.99%) neonates were of normal birth weight, 485 (39.17%) of low birth weight, and 35 (2.82%) of large weight.

Table 1: General characteristics of inborn live births.

| Live births | 1238 |
|-------------|------|
| Full term   | 1024 (82.7%) |
| Preterm     | 211 (17.04%) |
| Late preterm| 171   |
| Mod preterm | 23    |
| Very preterm| 16    |
| Extreme preterm | 01  |
| Post term   | 03 (0.24%)  |
| Normal birth weight (2500-3500 gm) | 718 (57.99%) |
| LBW (<2500 gm) | 485 (39.17%) |
| Large weight (>3500 gm) | 35 (2.82%) |
| AGA         | 1083 (87.47%) |
| SGA         | 84 (6.78%) |
| LGA         | 71 (5.73%) |

Table 2: General characteristics of LBW neonates.

|                | ELBW | VLBW1 | VLBW2 | LBW1 | LBW2 | LBW | NBW | LaBW |
|----------------|------|-------|-------|------|------|-----|-----|------|
| Total (1238)   | 07   | 12    | 10    | 95   | 361  | 485 | 718 | 35   |
| SNCU admission (217) | 07   | 12    | 10    | 71   | 47   | 147 (30.31%) | 69  | 01   |
| Extreme PT (01) | 01   | 00    | 00    | 00   | 00   | 01  | 00  | 00   |
| Very PT (16)   | 06   | 08    | 02    | 00   | 00   | 16  | 00  | 00   |
| Mod PT (23)    | 00   | 03    | 05    | 15   | 00   | 23  | 00  | 00   |
| Late PT (171)  | 00   | 00    | 02    | 67   | 86   | 155 | 16  | 00   |
| Full term (1024) | 00   | 01    | 01    | 13   | 274  | 289 (59.58%) | 700 | 35   |
| Postterm (03)  | 00   | 00    | 00    | 00   | 01   | 01 (0.20%) | 02  | 00   |
| SGA (84)       | 03   | 07    | 04    | 24   | 46   | 84 (17.32%) | 00  | 00   |
| AGA (1083)     | 04   | 05    | 06    | 71   | 315  | 401 (82.68%) | 682 | 00   |
| LGA (71)       | 00   | 00    | 00    | 00   | 00   | 00  | 36  | 35   |
| Male (683)     | 05   | 07    | 04    | 50   | 172  | 238 (49.07%) | 416 | 29   |
| Female (555)   | 02   | 05    | 06    | 45   | 189  | 247 (50.93%) | 302 | 06   |
| VD (875)       | 06   | 08    | 08    | 73   | 268  | 363 (74.84%) | 485 | 27   |
| LSCS (363)     | 01   | 04    | 02    | 22   | 93   | 122 (25.15%) | 233 | 08   |
Out of 485 low birth weight neonates; 456 (94.01%) were low birth weight weighing more than 1500 grams (LBW), 22 (4.53%) were VLBW, and 07 (1.44%) were ELBW. 361 (74.43%) were LBW2 (birth weight ≥2000 - <2500 grams), 95 (19.58%) were LBW1 (birth weight ≥1500 - <2000 grams), 10 (2.06%) were VLBW2 (birth weight ≥1250 - <1500 grams), 12 (2.47%) were VLBW1 (birth weight ≥1000 - <1250 grams); and 07 (1.44%) were ELBW (birth weight <1000 grams).

Table 3: Comparison of morbidities of LBW neonates with normal birth weight and large birth weight neonates.

|                      | Inborn LBW (1500-<2500 grams) | Inborn NBW (2500-<3500) | Inborn large birth weight (≥ 3500) |
|----------------------|--------------------------------|-------------------------|-----------------------------------|
| Total                | 456                            | 718                     | 35                                |
| SNCU admission       | 118 (25.8%)                    | 69 (9.61%)              | 01 (2.85%)                        |
| At least one morbidity occurred | 112 (24.56%) | 114 (15.96%) | 04 (11.43%)                        |
| Birth asphyxia       | 22 (4.82%)                     | 33 (4.59%)              | 01 (2.85%)                        |
| Mod – Sev HIE        | 04                             | 10                      | 00                                |
| Sepsis               | 17 (3.72%)                     | 06 (0.83%)              | 00                                |
| RDS                  | 10 (2.19%)                     | 00 (00%)                | 00                                |
| MSAF                 | 58 (12.71%)                    | 103 (14.3%)             | 04 (11.4%)                        |
| MAS                  | 02 (0.44%)                     | 10 (1.39%)              | 00                                |
| PPHN                 | 01 (0.22%)                     | 04 (0.55%)              | 00                                |
| TTN                  | 25 (5.48%)                     | 17 (2.36%)              | 00                                |
| Apnea                | 05 (of which 1 secondary)      | 00 (00%)                | 00                                |
|                      | (0.87%)                        |                         |                                   |
| Feed intolerance     | 05 (1.09%)                     | 00 (00%)                | 00                                |
| NEC                  | 01 (0.22%)                     | 00 (00%)                | 00                                |
| Hyperbilirubinemia   | 60 (13.1%)                     | 66 (9.19%)              | 03 (8.57%)                        |
| Polycythemia         | 01 (0.22%)                     | 00 (00%)                | 00                                |
| Hypoglycemia         | 06 (1.31%)                     | 00 (00%)                | 00                                |
| Thrombocytopenia     | 02 (0.44%)                     | 00 (00%)                | 00                                |
| DIC                  | 02 (0.44%)                     | 01 (0.14%)              | 00                                |
| Coagulopathy         | 01 (0.22%)                     | 00                      | 00                                |
| Hyponatremia         | 01 (0.22%)                     | 00                      | 00                                |
| Hypernatremia        | 01 (0.22%)                     | 00                      | 00                                |
| Hypocalcemia         | 00                             | 00                      | 00                                |
| ARF                  | 03 (0.66%)                     | 01 (0.14%)              | 00                                |
| Prerenal failure     | 01 (0.22%)                     | 00                      | 00                                |
| Malformations        | 14 (3.07%)                     | 06 (0.83%)              | 00                                |
| Major malformations  | 09 (1.97%)                     | 2 (0.27%)               | 00                                |
| PDA                  | 06 (of which 3 large> 2 mm)    | 03 (of which 1 large > 3 mm) | 00 |
|                      | (0.65%)                        | (0.14%)                 |                                   |
| Need for respiratory support (CPAP/Ventilator) | 22 (4.82%) | 17 (2.36%) | 00 |

Need for SNCU admission is significantly higher in LBW compared to normal birth weight neonates (25.8 % vs 9.61 %).

It was least in large birth weight neonates (2.85%).

Many of the morbidities were higher in LBW neonates compared to normal birth weight neonates.

Difference was more significant in risk of sepsis (3.72% vs 0.83%), RDS (2.19% vs 0%), TTN (5.48% vs 2.36%), hyperbilirubinemia (13.1 % vs 9.19%), hypoglycemia (1.31% vs 0%), feed intolerance (1.09% vs 0%) and risk of major congenital malformation (1.97% vs 0.27%).

Need for respiratory support was 4.82% in LBW vs 2.36% in normal birth weight neonates.

Incidence of birth asphyxia was only slightly higher in LBW neonates (4.82% vs 4.59%).

Incidence of MAS and PPHN were higher in normal birth weight neonates compared to LBW neonates (1.39% vs 0.44%, and 0.55% vs 0.22%).
Amongst LBW neonates; morbidities were significantly higher in VLBW and ELBW neonates. On comparing LBW2 and LBW1 neonates, it was found that morbidities were significantly lower in LBW2 group—nearly comparable to found in normal birth weight neonates.

Table 4: Comparison of morbidities of among LBW neonates.

| Inborn ELBW | Inborn VLBW1 | Inborn VLBW2 | Inborn LBW1 | Inborn LBW2 | Inborn LBW TOTAL |
|-------------|--------------|--------------|-------------|-------------|-----------------|
| Total       | 07           | 12           | 10          | 95          | 361             |
| SNCU admission | 07 (100%)   | 12 (100%)    | 10 (100%)   | 71 (74.7%)  | 47 (13.02%)     |
| At least one morbidity occurred in | 07 (100%) | 12 (100%) | 07 (70.00%) | 47 (49.47%) | 65 (18.00%) |
| Birth Asphyxia | 04 (57.14%) | 06 (50%)     | 01 (10%)    | 08 (8.42%)  | 14 (3.88%)      |
| Mod – Sev HIE | 01          | 03           |             |             |                 |
| Sepsis      | 03 (42.86%)  | 07 (58.33%)  | 00          | 12 (12.63%) | 05 (1.38%)      |
| RDS         | 05 (71.43%)  | 07 (58.33%)  | 02 (20%)    | 10 (10.5%)  | 00 (0%)         |
| MSAF        | 01 (14.28%)  | 00           | 00          | 10 (10.5%)  | 48 (13.3%)      |
| MAS         | 00           | 00           | 00          | 00 (00%)    | 02 (0.55%)      |
| PPHN        | 00           | 00           | 00          | 00 (00%)    | 01 (0.28%)      |
| TTN         | 00           | 00           | 00          | 14 (14.74%) | 11 (3.05%)      |
| Apnea       | 01 (Secondary) | 01 (8.33%) | 00 | 04 (4.21%) | 01 (Secondary) | 07 (02 secondary) |
| Feed intolerance | 01 (14.28%) | 00 | 00 | 02 (2.10%) | 03 (0.83%) | 06 |
| NEC         | 02 (28.57%)  | 01 (8.33%)   | 00          | 01 (1.05%)  | 00              |
| Hyperbilirubinemia | 01 (14.28%) | 03 (25%)     | 06 (60%)    | 26 (27.37%) | 34 (9.41%)      |
| Polycythemia | 00           | 01 (8.33%)   | 00          | 01 (1.05%)  | 00              |
| Hypoglycemia | 00           | 02 (16.66%)  | 00          | 04 (4.21%)  | 02 (0.55%)      |
| Thrombocytopenia | 00           | 00           | 00          | 01 (1.05%)  | 01 (0.28%)      |
| DIC         | 00           | 01 (8.33%)   | 00          | 02 (2.1%)   | 00              |
| Coagulopathy | 00           | 00           | 00          | 00 (00%)    | 01 (0.28%)      |
| Hyponatremia | 00           | 00           | 00          | 00          | 01 (0.28%)      |
| Hypertension | 00           | 00           | 00          | 01 (1.05%)  | 00              |
| Hypocalcemia | 00           | 00           | 00          | 00          | 00              |
| ARF         | 01 (14.28%)  | 01 (8.33%)   | 00          | 01 (1.05%)  | 02 (0.56%)      |
| Prerenal failure | 00           | 00           | 00          | 01 (1.05%)  | 00              |
| Major malformations | 00           | 00           | 00          | 02 (2.10%)  | 08 (2.22%)      |
| PDA         | 00           | 03 (all large) (25%) | 02 (of which 1 large) (10%) | 06 (of which 3 large) (3.15%) | 00 (00%) | 11 (7 large) |
| Need for respiratory support (CPAP/Ventilator) | 04 (57.14%) | 11 (91.6%) | 02 (20%) | 17 (17.89%) | 05 (1.38%) | 39 (8.04%) |

Incidence of morbidities in LBW2 vs LBW1: Birth asphyxia (3.88% vs 8.42%), sepsis (1.38% vs 12.63%), RDS (0% vs 10.5%), TTN (3.05% vs 14.74%), hyperbilirubinemia (9.41% vs 27.37%), hypoglycemia (0.55% vs 4.21%), primary apnea (0% vs 4.21%), feed intolerance (0.83% vs 2.1%).

Incidence of MAS and PPHN was higher in LBW2 compared to LBW1 (0.55% vs 0%, and 0.28% vs 0%). There was not much difference in incidence of major malformations (2.10% vs 2.22%).

Incidence of PDA was higher in LBW1 group (3.15% vs 0%). Need for respiratory support was significantly higher in LBW1 group compared to LBW2 group (17.89% vs 1.38%).

On comparison of LBW1a (birth weight ≥1500 - <1800 grams) and LBW1b (birth weight ≥1800 - <2000 grams); it was found that at least one morbidity occurred in 37.5% of LBW1b neonates, while in 66.66% of LBW1a neonates at least one morbidity occurred.
Morbidities were higher amongst LBW1a neonates compared to LBW1b neonates, in particularly incidence of sepsis (20.51% vs 7.14%), RDS (20.51% vs 3.57%), apnea (10.25% vs 0%), feed intolerance (2.56% vs 1.78%), hyperbilirubinemia (25% vs 19.64%). Incidence of major congenital malformations was 2.56% vs 1.78%. Incidence of PDA was 3.57% vs 1.78%.

### Table 5: Comparison of morbidities of among LBW neonates weighing ≥1500 - <1800 grams and ≥1800 - <2000 grams.

| Inborn LBW1 | Inborn ≥1500 - <1800 (LBW1a) | Inborn ≥1800 - <2000 (LBW1b) |
|-------------|-----------------------------|-----------------------------|
| Total       | 95                          | 39                          | 56                          |
| SNCU admission | 71 (74.73%)               | 38 (97.43%)                | 33 (58.9%)                |
| Not any morbidity | 48 (50.53%)           | 13 (33.33%)                | 35 (62.5%)                |
| At least one morbidity | 47 (49.47%)         | 26 (66.66%)                | 21 (37.5%)                |
| Birth asphyxia | 08 (8.42%)               | 03 (7.69%)                 | 04 (7.14%)                 |
| Mod – Sev HIE | 01                         | 00                          | 00                          |
| Sepsis       | 12 (12.63%)               | 08 (20.51%)                | 04 (7.14%)                |
| RDS          | 10 (10.5%)                | 08 (20.51%)                | 02 (3.57%)                |
| MSAF         | 10 (10.5%)                | 07 (17.95%)                | 03 (5.36%)                |
| MAS          | 00 (00%)                  | 00                          | 00                          |
| PPHN         | 00 (00%)                  | 00                          | 00                          |
| TTN          | 14 (14.74%)               | 06 (15.38%)                | 08 (14.28%)                |
| Apnea        | 04 (4.21%)                | 04 (10.25%)                | 00                          |
| Feed intolerance | 02 (2.10%)             | 01 (2.56%)                 | 01 (1.78%)                 |
| NEC          | 01 (1.05%)                | 01 (2.56%)                 | 00                          |
| Hyperbilirubinemia | 26 (27.37%)          | 14 (25%)                   | 11 (19.64%)                |
| Polycythemia | 01 (1.05%)                | 00                          | 01 (1.78%)                 |
| Hypoglycemia | 04 (4.21%)                | 01 (2.56%)                 | 03 (5.36%)                 |
| Thrombocytopenia | 01 (1.05%)            | 00                          | 01 (1.78%)                 |
| DIC          | 02 (2.10%)                | 01 (2.56%)                 | 01 (1.78%)                 |
| Coagulopathy | 00                         | 00                          | 00                          |
| Hyponatremia | 00                         | 00                          | 00                          |
| Hypernatremia | 01 (1.05%)               | 00                          | 01 (1.78%)                 |
| Hypocalcemia | 00                         | 00                          | 00                          |
| ARF          | 01 (1.05%)                | 01 (2.56%)                 | 00                          |
| Prerenal failure | 01 (1.05%)             | 00                          | 01 (1.78%)                 |
| Major malformations | 02 (2.10%)         | 01 (2.56%)                 | 01 (1.78%)                 |
| PDA          | 06 (of which 3 large) (3.15%) | 04 (02 large) (3.57%)    | 02 (01 large) (1.78%)     |
| Need for respiratory support (CPAP/Ventilator) | 17 (17.89%) | 13 (33.33%) | 04 (7.14%) |

### Table 6: Comparison of outcome among LBW neonates weighing ≥1500-<1800 grams and ≥1800-<2000 grams.

| Inborn LBW1 | Inborn LBW ≥1500 - <1800 (LBW1a) | Inborn LBW ≥1800 - <2000 (LBW1b) |
|-------------|-----------------------------|-----------------------------|
| Total       | 95                          | 39                          | 56                          |
| SNCU admissions | 71 (74.73%)               | 38 (97.43%)                | 33 (58.93%)                |
| Discharged  | 92 (96.84%)                | 36 (92.30%)                | 56 (100%)                  |
| Death       | 01 (1.05%)                 | 01 (2.56%)                 | 00                          |
| DAMA        | 02 (2.10%)                 | 02 (5.13%)                 | 00                          |
| DAMA-Moribund | 01                         | 01                          | 00                          |
| Death + DAMA-Moribund | 02 (2.10%)       | 02 (5.13%)                 | 00 (00%)                   |
| Transferred | 00                         | 00                          | 00                          |
Need for respiratory support was significantly higher amongst LBW1a neonates compared to LBW1b (33.33% vs 7.14%). There was not much difference in incidence of asphyxia (7.69% vs 7.14%), and of TTN (15.38% VS 14.28%). Incidence of hypoglycemia was higher in LBW1b group (5.36% vs 2.56%). Outcome was significantly better in LBW1b group compared to LBW1a group with discharge rate of 100% in LBW1b group compared to 92.3% in LBW1a group. Poor outcome in the form of combined death and DAMA in moribund state was 5.13% in LBW1a group, while poor outcome was not noted in any neonate amongst LBW1b group.

Overall outcome was poor in LBW neonates compared to normal weight neonates (1.31% vs 0.56%). All of the large birth weight neonates had good immediate neonatal outcome.

Amongst all LBW neonates, overall poor immediate outcome was found in 3.92%. Poor immediate outcome was 1.11% in LBW2, 2.10% in LBW1, 10% in VLBW1, 41.66% IN VLBW1, and 100% in ELBW.

**DISCUSSION**

The prevalence of LBW is a good indicator of mother’s health and maternal nutritional status. The incidence of LBW in Asia as a whole is 19.7%. That of Europe, USA and Korea is 6.5%, 7% and 6-8% respectively. The incidence of LBW in our hospital was 39.17%. Study by Kutubur et al showed incidence of LBW of 27.14%. Study by Negi et al showed incidence of LBW of 26.8%. In present study, M:F ratio was 1:1.038. Incidence of LBW, VLBW AND ELBW was 94.01%, 4.53% and 1.44% respectively. 59.58% of low birth weight neonates were full term and 17.32% were SGA. Of full term LBW neonates majority (94.8%) were between 2000 – 2500 grams. Study by Manikyamba D et al. showed M:F ratio of 1:1.1. In the same study incidence of LBW, VLBW and ELBW was 65.56%, 22.57% and 11.85% respectively. 73.8% were preterm and 26.2% were term IUGR babies.

Need for SNCU admission is significantly higher in LBW compared to normal birth weight neonates (25.8 % vs 9.61 %). Many of the morbidities were higher in LBW neonates compared to normal birth weight neonates. Difference was more significant in risk of sepsis (3.72% vs 0.83%), RDS (2.19% vs 0%), TTN (5.48% vs 2.36%), hyperbilirubinemia (13.1 % vs 9.19%), hypoglycemia (1.31% vs 0%), feed intolerance (1.09% vs 0%) and risk of major congenital malformation (1.97% vs 0.27%). Need for respiratory support was 4.82% in LBW vs 2.36% in normal birth weight neonates. Incidence of birth asphyxia was only slightly higher in LBW neonates.
(4.82% vs 4.59%). Incidence of MAS and PPHN were higher in normal birth weight neonates compared to LBW neonates (1.39% vs 0.44%, and 0.55% vs 0.22%). In a study by Mukeshkumar Gupta et al. major morbidities in LBW were neonatal jaundice (30.5%), respiratory distress (28.5%), HMD (14.5%), septicaemia (23.5%). In a study by Budhathoki S et al. three major complications in LBW neonates were clinical sepsis, non-physiological sepsis and hypoglycaemia.

Amongst LBW neonates; morbidities were significantly higher in VLBW and ELBW neonates. On comparing LBW2 and LBW1 neonates, it was found that morbidities were significantly lower in LBW2 group – near comparable to found in normal birth weight neonates. Morbidities were higher amongst LBW1a neonates compared to LBW1b neonates. At least one morbidity occurred in 37.5% of LBW1b neonates, while in 66.66% of LBW1a neonates at least one morbidity occurred.

Immediate poor outcome in the form of combined death and DAMA cases in moribund state was in 3.92% in low birth weight neonates, while it was 0.56% in normal weight neonates and 0% in large weight neonates. Poor immediate outcome was 1.11% in LBW2, 2.10% in LBW1, 10% in VLBW1, 41.66% in VLBW2, and 100% in ELBW. Outcome was significantly better in LBW1b group compared to LBW1a group with discharge rate of 100% in LBW1b group compared to 92.3% in LBW1a group. Overall survival rates as per Manikyamba D et al. was 76% for LBW babies, 32% for VLBW and 65% for ELBW babies. In a study by Budhathoki S et al. it was shown that birth weight and age was the number of babies left against medical advice (LAMA). In a study by Anuradha Bansal et al. overall mortality of VLBW babies was 24.6%. In a study by Poudel P et al. survival rate in VLBW neonates was 54.3%. In a study by Basu S et al. mortality rate of 37% was reported in VLBW neonates. In a study by Acharya N et al. mortality rate in ELBW and VLBW babies were 69.7% and 25% respectively. In a study by K K Roy et al. - The commonest neonatal complications in both VLBW and ELBW babies were RDS, neonatal jaundice and sepsis. The neonatal mortality rate till discharge was 15.7% in VLBW group and 33.3% in ELBW group.

Study by Singh M et al. has shown improved survival with increase in both the birth weight and gestational age. Present study results were in accordance with Singh et al.

CONCLUSION

The major determinants for mortality in low birth weight babies were the birth weight. Mortality was highest in ELBW followed by VLBW and followed by LBW. Also, there exist positive correlation between birth weight and morbidity conditions.

The higher incidence and mortality of LBW especially ELBW and VLBW1 neonates in present study indicates a need for prevention of such neonates by improving maternal health and care, provision of good community based newborn care, good neonatal transport facility, upgradation of NICU facilities in Government hospitals, provision of free neonatal care by private hospitals under public private partnership program and ensuring adequate manpower with their regular training. With all these efforts together, it will be possible to achieve the INAP goal of NMR less than 10 by 2030.

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