NEONATAL MORTALITY IN ASSOCIATION WITH LOW BIRTHWEIGHT

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Abstract
Aim: 730 low birth weight (LBW) neonates and 1460 controls were selected from 13,123 neonates born from Mayo Hospital Lahore from June 2019 to May 2020, and were compared for mortality in the first seven and up to 28 days of life (early neonatal period).
Methods: In this study all low birth weight newborns are divided according to four sub-groups of birth weight, and the mortality within the first seven (early neonatal mortality) and up to twenty-eight days of life (neonatal mortality) is examined in both groups.
Results: Part of the results are as follows: I-low infants comprise 5.6% of total newborns, 2-14.3% of LBW neonates die within the first seven days of life, 3-75% of very LBW neonates (less than 1500 g) die within the first seven days of life, 4-low birth weight neonates have a mortality rate twenty four times that of normal birth weight infants in the first and fourth weeks of life, 5-neonatal mortality rate in this study was 18 per thousand.
Conclusion: In conclusion, our recommendation is for provision of the first line of approach i.e. special intensive care is of primary importance for helping the survival of premature infants.
Key Words: low birth weight, neonatal mortality, newborns

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INTRODUCTION:

The infant mortality rate (IMR), one of the most important health indicators, has fallen and continues to fall in developed countries and reaches from 7 to 25 per thousand newborns, depending on the health status of these countries[1-3].

In developing countries, IMR are represented by very different numbers due to the large differences in the socio-economic status of these countries[4-5]. According to WHO; this ratio is between 26-200/10000.

In Pakistan, IMR is generally declining, and a study of 1% of Pakistan's total population in 1988 shows that this figure is 45. I.M.R[6-8]. the following questions are relevant:

1.   What percentage of children with low birth weight is included in this rate? So, what is the LBW's contribution to infant mortality?
2.   Was the decrease in neonatal mortality parallel to IMR?
3.   What are the differences between BPN mortality and normal children?
4.   What other measures can you take to plan and run programs to correct this problem?

The survey was designed and conducted to examine various variables to examine previous questions; The results of this study will be published gradually[9]. This article contains the results of the first data analysis, which includes the number of low-birth weight babies and death rates up to the first and twenty-eight days of age.

MATERIAL AND METHODS:

This Cross-Sectional study was held in the Unit-IV Lady Aitchison Hospital Lahore for one-year duration form June 2019 to May 2020. All women who were referred for childbirth were interviewed in hospital and a questionnaire containing a large number of variables was completed. For all children weighing less than 2500 g at birth, an additional questionnaire containing more detailed information on mothers and newborns was completed and registered.

At this stage, two children with a normal birth weight were randomly selected for inspection for each child with a low birth weight, and the same detailed questionnaire for each child was completed and registered. For more information on survival or death of newborns indicated during the 1st seven to twenty-eight days of life, and the following information:

1-   Well-trained nurses joined these children while they were in hospital, and trained personnel noted all events related to this period.
2-   On the day the mothers were released, the fathers were provided with two forms and two sealed envelopes, one of which was asked to publish information about the first week of the newborn, and the other at the end of the twenty-eighth day of the newborn's life and these completed forms. When mothers began to answer and send completed forms, this information was recorded in the original private survey.
3-   An additional form is sent to mothers who do not answer within the required time or contact them by phone (in the case of persons providing telephone numbers) and are asked to report the situation.
4-   Who still do not answer, visited the house at the address indicated. Although many of these addresses cannot be easily identified, every effort has been made to find these mothers and visit home. Although every effort was made to continue the study, at the end of the study, 8% of newborns and 14% of 28-day-old children over 28 days of age were not found mainly due to migration, incorrect address or address change and therefore cannot be included in this study.

RESULTS:

730 or 6% of 13,123 newborns are low birth weight children. At random sampling, 1,457 newborns with normal birth weight were selected for inspection and interviewed while the mothers of both groups were in the hospital. A trained interviewer completed and completed a special survey.

Children with LBW are divided into 4 subgroups (Table 1).

Table 1. Frequency distribution and percentage of LBW newborns according to birth weight

Frequency/Weight (g)	No.	%
<1000gm	18	2.5
1000-1499	52	7.1
1500-1999	130	17.8
2000-2499	530	72.6
Total	730	100

About 10% of low-weight babies have very low birth weight (VLBW, less than 1500 g), and 90% have between 1500-2499 g, low average weight. Data from developed countries indicate that 1% of all newborns fall into the

LBW category, 2 of them overlap with our data in this study, and VLBW in this study contains less than 1% of the total birth.

During the first seven days of life 670 newborns with LBW were observed. During this period, 96 deaths were recorded during the first seven days, and this death was divided from day one to day seven (Table 2).

Table 2. Comparison of neonatal mortality of case and control newborns

Outcome/Weight	>2500			>2500		
	No.	%	Cumulative %	No.	%	Cumulative %
Death first day	43	6.4%	6.4%	2	0.1%	0.1%
Death 2nd day	23	3.4%	9.9%	3	0.2%	0.4%
Death 3rd day	15	2.2%	12.1%	0	0.0%	0.4%
Death 4th day	8	1.2%	13.3%	0	0.0%	0.4%
Death 5th day	2	0.3%	13.6%	1	0.1%	0.4%
Death 6th day	3	0.4%	14.0%	1	0.1%	0.5%
Death 7th day	2	0.3%	14.3%	1	0.1%	0.6%
alive after seven days	574	85.7%	100.0%	1327	99.4%	100.0%
Total	670	100.0%	-	1335	100.0%	-

From the data presented in Table 2 it follows as follows:

1- 4.3% of children with LBW die in the first week of life.

2- The number that died in the first 24 hours is twice the 2nd day, three times the 3rd day, five times the 4th day and 20 times the 5th, 6th and 7th day. In other words, 45% of deaths occur in the first 24 hours of labor in the first week of life for low-birth weight babies, and the risk of death decreases as the baby progresses towards the end of the first week of life.

3- A comparison of the number of deaths between LBW and normal birth weight shows that this figure is 14.3% for LBW, although the figure is 6% in the last group. In other words, children with low birth weight are 24 times more expected to die than children with normal-birth weight.

Table 3 shows the mortality of L.B. W. children are 24 times more than normal birth weight in the 1st seven days of life, and the death rate of these children in the first 28 days of life is about 23 times higher than in overweight children.

Table 3. Comparison of neonatal mortality of case and control in the first seven and twenty-eight days of life

Death/Days	Case			Control		
	No. Followed up	No. of Deaths	% of Deaths	No. Followed up	No. of Deaths	% of Deaths
1-7	670	96	14.3%	1335	8	0.6%
1-28	629	115	18.3%	1251	10	0.8%

According to Table 4, 90% of neonates below than 1000 g die in the first week of life. This figure is 70% for those who weigh between 1000-1500 gm, 75% for those who weigh less than 1500 g, and for those who weigh between 1500-2499 g, only 5% in the first week of life. In other words, the chance of survival increases as the birth weight increases.

Table 4. Frequency distribution and death of LBW neonates in first seven days of life according to birth subgroups

Death/Weight (g)	No. Newborn	No. Death	% Deaths
<1000 g	18	16	89%
1000-1499	46	32	70%
1500-1999	124	26	21%
2000-2499	482	22	5%
Total	670	96	14%

From table 5 we can say:

1- 1-18% of newborns lighter than 2500 g die within the first 28 days of life,

2-   Children with MBPN (birth weight less than 1500 g) are extremely at risk.
3-

Table 5. Frequency distribution of neonatal death in first 28 days of life according to birth subgroups

Death/Weight (g)	No. Newborn	No. Death	% Deaths
<1000 g	18	16	89%
1000-1499	46	34	74%
1500-1999	114	35	31%
2000-2499	451	30	7%
Total	629	115	18%

Based on the results of this study, the probability of infant death can be calculated as 18 per thousand, as shown in Table 6.

Table 6. Calculation of probability of neonatal morality rate

Case & Control/No. of Death	Ratio at Birth	No. Newborn	No. Death	Death Ratio in 28 Days	Probability of neonatal mortality rate
Case	0.056%	629	115	0.183%	0.010248%
Control	0.944%	1251	10	0.008%	0.007552%
Total	1%	1880	125	-	0.0178%

DISCUSSION:

In this study, the percentage of LBW (less than 2,500 g) born in statistically selected hospitals and delivery wards in Lahore accounts for 6% of all births. This number is favorably compared with a study carried out a year ago in Lahore. Given that 20% of the total Pakistani population lives in Lahore, and 85-95% of all births are in hospitals, "it is a country in the 10-14% range[10-13]. Our number in Lahore is compared to developed countries and differs significantly from developing countries: (similar to our country) this inconsistency can be explained because LBW is defined as follows:

a-   In this test it may be less than 2500 g, in other tests 2500 g of the LBW range,
b-   Most pregnant women were housewives and did not do any hard work,
c-   A pregnant woman in our culture has a special place in the family and every member of the family tries to compensate for any deficiencies. Neonatal and early neonatal mortality due to LBW is 24 and 23 times higher, respectively, than normal delivery[14]. IMR of the urban population made on 1% of the population is 31 per thousand for all urban areas, and the probability of infant mortality in our study is 18 per thousand, so this number is about 58% of the total IMR. Let's assume that this happened in the neonatal period, which includes most[15]. This number is in line with the number of developing countries. Given the low IMR trend in rural and urban areas, and 58% of total IMR in neonatal mortality, greater efforts should be made and preservatives to reduce neonatal deaths. This can be achieved by adopting the following strategies:

1-   Extending maternal and child health to provide prenatal services, educating mothers against changes in fertility and mother attitudes, and
2-   Improve services in hospitals and delivery wards to provide intensive care units for premature babies.

CONCLUSION:

Therefore, our recommendation is to focus on second place, which means that special intensive care is necessary to help survive premature babies.

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