

Mortality and Morbidity of Neonates Weighing less than 1500 Grams; Case Study of Sarem Women's Hospital

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ABSTRACT

Aims In the recent years, Advances in science and technology have decreased the mortality rate of premature infants significantly. Nevertheless, 70% of neonatal deaths still have a direct correlation with prematurity. It seems that updated statistics of mortality and morbidity rate of very low birth weight infants (VLBW) are necessary for proper planning. Although the mortality and morbidity rates of premature infants have been studied in many countries, there are few studies in this field in Iran. Therefore, this study was done to determine the mortality rate of neonates weighing less than 1500 grams.

Materials & Methods This retrospective cohort study was done in 138 premature infants with intrauterine age more than 24 weeks and birth weigh less than 1500 grams. These infants have been hospitalized in neonatal intensive care unit (NICU) of Sarem women's Hospital during the years 1388-1395.

Findings The mean birth weight of these infants was 1077.00±287.00 g and the mean gestational age was 28.90±3.00 weeks. The survival rate was 78.3% in this group. The highest survival rate was in the group of infants weighing 1500-1000 g and 90% of them were discharged from the hospital. The neonatal mortality rate increased with birth weight loss, so that in infants weighing less than 700 g survival rate was 27.8%.

Conclusion The mortality rate of infants increases with birth weight loss. In addition, the gestational age and apgar score of the fifth minute are related to neonatal mortality.

Keywords Premature infant; Very low birth weight; Mortality

CITATION LINKS

- [1] Outcomes of children of extremely low birth weight and gestational age in the 1990s
- [2] Surfactant effects on mortality and morbidity of respiratory distress syndrome in neonates
- [3] The INSURE method in VLBW preterm infant with RDS
- [4] Survival predictors of preterm neonates: hospital based study in Iran (2010-2011)
- [5] Effect of a home visit educational program on mortality and morbidity of preterm newborn
- [6] An overview of mortality and sequelae of preterm birth from infancy to adulthood
- [7] Causes and rate of mortality among the newborns in NICU and newborns unit at Imam Khomeini and Alavi Hospitals in Ardabil from September 2006 to September 2007
- [8] Causes of neonatal mortality in Kerman province in 2008-2009
- [9] Neonatal mortality of low birth weight infants in Yazd Iran
- [10] Profile of neonatal mortality in Iran in 2012
- [11] Mortality rate of preterm neonates in two teaching hospitals in Tehran, Islamic Republic of Iran
- [12] Neonatology at a glance
- [13] The NeoNed study group, the LNF study group (2012) mortality, neonatal morbidity and two year follow-up of extremely preterm infants born in the Netherlands in 2007
- [14] Neonatal outcomes of extremely preterm infants from the NICHD neonatal research network
- [15] Outcomes of 28+1 to 32+0 weeks gestation babies in the state of Qatar: finding facility-based cost effective options for improving the survival of preterm neonates in low income countries
- [16] Survival of very low birth weight infants in neonatal intensive care unit at the Mahdieh hospital (Tehran-Iran)
- [17] Determining the viability of preterm newborns hospitalized in the neonatal intensive care unit in Ghaem hospital, Mashhad
- [18] Survey of neonatal mortality in NICU in Amiralmomenin hospital of Zabol university of sciences in 2014
- [19] Advanced maternal age relationship with pregnancy complications
- [20] A survey of frequency and causes of perinatal mortality in Tehran
- [21] Causes and related factors of neonatal mortality in Qazvin NICU
- [22] Evaluation of the cause and predisposing factors in neonatal mortality based on international coding disease version10 in Aboozar Hospital of Ahvaz

Extended Abstract

Background

With the spread of perinatology and induced pregnancies, the rate of preterm birth has increased dramatically in recent decades^[1].

Previous studies

... [2-9]. Infant mortality is one of the indices of immersive development of countries in today's world. The World Health Organization has estimated preterm birth as the most prevalent cause of infant mortality in Iran over the past 15 years and estimated infant mortality as 10.7 per 1000 live births in 2012.^[3, 10] Although mortality and complications of preterm birth based on gestational age have been studied in many countries, few studies have been conducted in Iran, and it has often been a long time since these studies^[11].

Aim(s)

The aim of this study was to determine the mortality rate of infants weighing less than 1500g.

Research type

This study is retrospective cross-sectional.

Research society, place, and time

In preterm infants, who were admitted to the neonatal intensive care unit (NICU) at Sarem Hospital from 2009 to September 2016.

Sampling method and number

The samples included 138 preterm infants with a gestational age of more than 24 weeks weighing less than 1500g, who were selected based on a census during a period of 7.5 years.

Used devices & materials

In this study, a checklist was used to collect the data. The data of the cases regarding mortality and its causes, maternal diseases before and during pregnancy, type of delivery, obstetric events, and complications of prematurity were investigated. The exclusion criteria were neonates with severe congenital anomalies that were excluded from the study.

Fisher exact, independent T and Mann-Whitney tests were used in SPSS 22 software to analyze the data.

Finding by Text

Of the 138 infants, 62 were male and 75 were female, and the mean age of mothers was 32.31±5.60 years (19-52 years). The mortality rate between female and males groups was 22.6% and 21.3%, respectively, which was not statistically significant ($p=0.511$). Also, the mean age of the mothers of dead infants was 31.21±5.90 years and the mean age of the mothers of discharged infants was 32.62±5.40 years. There was no significant difference between the two groups ($p=0.231$).

The mean birth weight of the infants was 1077.00±287.00 g and the mean gestational age was 28.90±3.00 weeks. Totally, 108 infants died and 30 infants were discharged. The survival rate was 78.3% in this group. The highest mortality rate was in weights less than 700g and the survival rate in this group was 27.8%, while this increased with weight gain, so that 90% of infants weighing 1000-1500 g survived (Table 1).

Survival rate had a direct relationship with increase in gestational age, so that the survival rate was 45.5% in the age group less than 26 weeks, while in the age group of more 32 weeks weighing less than 1500g, 94.7% of the infants survived (Table 2).

Table 1) Distribution of relative and absolute frequency (numbers in parentheses are percentages) of the mortality and survival rate of preterm infants based on birth weight (138 people)

Birth weight (g)	Mortality rate	Survival rate	No.
700>	13 (72.2)	5 (27.8)	18
700-1000	9 (22.5)	31 (77.5)	40
1000-1500	8 (10)	72 (90)	80

In the Apgar score at the 5th minute, there were no information about 6 samples, but it was 6.04±1.99

Table 2) Distribution of relative and absolute frequency (numbers in parentheses are percentages) of the mortality and survival rate of preterm infants based gestational age (138 people)

Gestational Age (Week)	Mortality rate	Survival rate	No.
26>	18 (54.5)	15 (45.5)	33
26-28	8 (22.9)	27 (77.5)	35
28-30	3 (8.8)	31 (91.2)	34
30-32	-	17 (100)	17
32<	1 (5.3)	18 (94.7)	19
Total	30 (21.7)	108 (78.3)	138

in the dead infants, and 8.06 ± 1.52 in the discharged infants, which showed a significant difference between the two groups ($p < 0.05$).

Of all infants with weight less than 1500g, 34 cases (24.6%) were born through vaginal delivery and 104 (75.4%) were born by cesarean section. The highest percentage of vaginal delivery was in weights less than 700g so that 7 cases of vaginal delivery versus 11 cases of cesarean section (38.8%) were performed. With increasing weight, the vaginal delivery rate decreased, which was 11 vaginal delivery versus 29 cases of cesarean section (27.5%) in weights 700-1000g and 11 vaginal delivery versus 69 cases of cesarean section (13.75%) in weights 1000-1500g. Due to the fact that the delivery method in different weights did not have the same distribution and with increasing weight, the rate of cesarean section increased, the relationship between delivery method and infant mortality was not statistically investigable.

The most common cause of preterm delivery was early onset of labor pain (30 cases), pre-labor rupture of membranes and its complications (26 cases), and preeclampsia (26 cases).

Main comparison to similar studies

...^[12-14]. The mortality rate of preterm infants with the gestational age of 28-32 weeks in Qatar was 6.53%. In this study, mortality rate in this age group is 5.88%, which is consistent with this study^[15].

Afjeh et al. reported a life expectancy of infants with very low birth weight in Mahdih Hospital of Tehran as 70.9%. In addition, the mortality rate was 63.3% for gestational age less than 28 weeks, 12.3% for 29-32 weeks, and 1% for more than 33 weeks^[16]. In another report from Ghaem Hospital in Mashhad, mortality rate in infants with less than 25 weeks of gestational age was 90%^[17]. In the present study, life expectancy in infants with a low birth weight was 78.3% and mortality at the gestational age of less than 28 weeks was 38.2%, which is better than statistics in Iran and comparable with advanced countries.

In the present study, the mean age of mothers was 32.31 ± 5.60 (19-52 years). In a study conducted by Arefnejad et al., the mean age of mothers was 27.36 ± 5.89 and no significant difference was observed between maternal age and infant mortality^[18], while in a study carried out by Keshavarzi et al., with the increase in maternal age, preterm labor and postterm pregnancy decreased^[19]. Also, in a study that evaluated the rate and causes of infant mortality in Tehran, the age group over 35 years in mothers was associated with an increased risk of infant mortality^[20].

In the present study, of 138 infants, 62 were male and 75 were female, and their mortality rate was 22.6% and 21.3%, respectively, which did not show a statistically significant difference ($p = 0.511$). This finding was consistent with studies conducted by Sarreshetdari et al.^[21] and Alijani et al.^[22] stating that there is no relationship between infant mortality and gender.

In the dead infants, Apgar score at the 5th minute was 6.04 ± 1.99 and 8.06 ± 1.52 in the discharged infants, showing a significant difference between the two groups. This finding was also correlated with research by Sarreshetdari et al. so that there was a statistically significant relationship between Apgar score and infant mortality^[21].

Suggestions

It is suggested that further studies be conducted on the survival rate of low birth weight infants in the early postnatal period, as well as the study of the developmental state of these infants in the future.

Limitations

Limitations of this study include the limited number of infants weighing less than 1500g. Also, the statistics show the status of infants during hospitalization and the status of infants has not been investigated after discharge.

Conclusion

With reducing birth weight, the infant mortality rate increases. In addition, the gestational age and Apgar score at the 5th minute of birth are also related to infant mortality.

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Conflict of interest

None declared by the authors.

Ethical permissions

The current study was retrospective and it did not interact with the treatment of infants. Personal information of patients remained confidential.

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