
The Effect of Weight and Gestational age on Neonatal Mortality

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Abstract:

Background: neonatal mortality has progressively declined in recent decades, this depend primarily on preventing the low birth weight infants, prenatal diagnosing and early treatment of diseases that result from factors during gestation and delivery.

Patients & methods: retrospective study was done in the nursery unit at Al- Kadhimia Teaching Hospital to study the risk factors of neonatal mortality; we study the birth weight, the gestation age and sex as risk factors during the period 1997-2000.

Results: The total no. of admission to NCU (Nursery care unit) was 1264 newborn baby, the no. of death was 402 cases, and most of these cases 341 were below 2.500 kg.

The higher mortality occurs in newborn with gestation age 28- 32 weeks mostly among males in all gestational age and birth weight.

Conclusion: birth weight and gestational age consider the major determinants of neonatal death, the lower the birth weight and gestational age the higher the mortality.

Key words: Mortality, Birth weight, Gestational Age, Nursery Care Unit (NCU).

Introduction:

Neonatal mortality (death that occur in the first 28 days of life) has progressively declined in recent decades, this reduction of mortality and in morbidity depend primarily on preventing the birth of low birth weight infants, prenatal diagnosis and early treatment of diseases that result from factors acting during gestation and delivery.

The highest mortality occur in the first 24hr of life and account for about 65% (about two third) of deaths in children less than one year of age and about four – tenth of deaths in children less than 5years^[1].

Worldwide 98% of all neonatal deaths occur in developing countries and largely attributed to infections, consequences of prematurity and low birth weight, birth asphyxia and congenital anomalies^[1].

Neonatal mortality is mostly associated with low birth weight together with low gestation age and the diseases associated with low birth weight and to lethal congenital anomalies e.g. Central nervous system, cardiac and respiratory.^[2] Gestational age (GA) and birth weight (BW) were the most important factors that influenced the survival rate.^[3]

Aim of the study:

In our retrospective study in (NCU) we regard the birth weight, gestational age and the sex as risk factors for neonatal mortality.

Patients & Methods:

A retrospective study was done in the nursery care unit at Al- Kadhimia Teaching hospital to study the risk factors of neonatal mortality; we study the birth

weight, the gestational age and the sex as risk factors for neonatal mortality in the period between 1997-2000.

The total No. of admissions to the NCU was 1264 newborn baby who delivered in our hospital and were admitted to the NCU, the cause of admission to the NCU were prematurity and low birth weight, birth asphyxia, respiratory distress syndrome, congenital anomalies, and meconium aspiration, sepsis. The total No. of died cases were 402 cases.

Results:

It had been found that the total no. of deaths was 402cases(31.8%)most of these cases (341case) were below 2.500kg body weight while those with birth weight more than 2.500kg only 61case.

It had been found that the highest mortality occur in the preterm babies (<37week gestation) and those with low birth weight for their gestational age also the deaths occur more between the male than female who were admitted to the NCU.

We found the higher mortality occur in those with birth weight between 1000-1500kg (208) case, and 134cases with a birth weight of 1600-2500kg.the results were shown in table (1)

The gestational age of the died cases were studied and we found the higher mortality occur in new born with gestational age between 28-32week was261 and the lower mortality occur between neonate with gestational age of 37-40weeks was46, while the mortality among those between33-36was 95case as shown in table (2).

Table (1): The relation of mortality with the birth weight and sex

Birth weight	No. of dead males	No. of dead females
1000-1500gm	122(30.3%)	86(21.3%)
1600-2500gm	78(19.4%)	55(13.6%)
>2500 gm	35(8.7%)	26(6.4%)
Total	235(58.45%)	167(41.54%)

Table (2): The relation of mortality to gestational age and sex

Gestational Age	No. of dead males	No. of dead females	Total
28-32 weeks	149(37.06%)	112(27.8%)	261(64.86%)
33-36 weeks	60(14.9%)	35(8.7%)	95(23.6%)
37-40 weeks	26(6.4%)	20(4.9%)	46(11.3%)

The mortality was higher among the males who were died in NCU; there were 235 cases while the female cases were 167cases.

All the died males were preterm with low birth weight.

The male constitute most of the low birth weight < 2.500 kg were 200 case while those more >2.500kg were 35 cases only.

Most of the died males were with short gestational

age between 28-32week (149cases), there was 60cases between 33-36week while those more than 37-40weeks only 26 cases.

The 167 died female newborn, the mortality was higher between the low birth weight (141) case who were <2.500kg and 26 cases > 2.500kg.

The same finding regarding the gestational age, the mortality was higher between those with short gestational age 112 case with gestation age of 28-

32weeks, 35cases of 33-36weeks and only 20cases Of 37-40 weeks gestation.

So the mortality was higher in male than in female in all-gestational age and in low birth weight. Table (1) & (2).

Discussion:

Birth weight traditionally has been used as a strong indicator for the risk of neonatal mortality.

It has been found that world wide 98% of all neonatal deaths occur in developing countries and largely attributed to consequences of prematurity and low birth weight in addition to infections, birth asphyxia and lethal congenital anomalies ^[1] similar results was observed in our study regarding the neonatal mortality, prematurity and low birth weight.

The mortality showed a remarkable decline as birth weight increase, the lowest mortality was among babies weight 2.500-3.000kg and of 38-40weeks gestations. Similar results noticed in this study when there was 61cases with a birth weight >2.500kg and 46cases of 38-40 weeks gestation.

Similar studies done and found that the majority of deaths occur in association with low birth weight with the least mortality occur in infants born with body weight >3.500kg and an increase in body weight of 100gm in the mean body weight associated with reduction of 30-50% in neonatal mortality ^[4], this relationship with the birth weight was notified in our study when we found the least mortality occur among newborns with body weight >2.500kg and the higher mortality occur among those of 1.000-1.500kg, now this can be prevented in many cases it is merely differed to the postnatal period.^[5]

The highest risk for neonatal mortality occur among infants <1000gm at birth and whose gestational age was < 30week, while the lowest mortality occur in infants with gestational age of 38-40week at birth with a birth weight of 3-4kg.^[6]

As the birth weight increase from 500-3000gm a logarithmic decrease in neonatal mortality occur for every week increase in gestation age from the 25th to the 37week, the mortality decrease by approximately one half.

In addition the neonatal mortality sharply rise for infants weighing over 4kg and gestational age of 42week or more, in our study we did not found such infants who were admitted to our nursery unit to compare such fact ^[7].

The differences in mortality between two sexes occur since the low birth weight and low gestational age occurs more in male than in female and as the birth weight and gestational age increase the survival improve. ^[7] Also the increased risk of neonatal mortality was found to be associated with male gender. ^[8]

Generally speaking for any given duration of gestation the lower the birth weight the higher the mortality and for any given weight the shorter the gestation duration the higher the mortality.

Conclusions:

Birth weight considered the major determinant of neonatal death and is closely related to gestational age.

Preterm birth is the leading cause of neonatal mortality and a substantial portion of all birth –related short and long –term morbidity.

The relationship between the birth weight and gestational age and neonatal mortality shows that the lower the birth weight the higher the mortality, and because of the high incidence of low birth weight (<2.500kg) it is considered the key factor in high neonatal mortality rates.

Recommendations:

-Prevention of the birth of premature infants should be more emphasized to decrease neonatal mortality and morbidity rates.

-Improve antenatal care by rebuilding new primary health care centers and increase accessibility of women at risk would probably lead to a reduction in prematurity, low birth weight and deaths. ^[9]

Regional perinatal programs should provide continuing education and consultation in both community and the referral centers, and transportation of pregnant women and new born infants to appropriate hospitals, they should also include a regional hospitals with facilities, equipments and personnel's for obstetrical and neonatal intensive care.

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