



The Outcome of Premature Infants Admitted To the neonatal intensive care unit in pediatric central teaching hospital in Baghdad

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ABSTRACT

Background: The World Health Organization (WHO) has defined premature infants as live born infants delivered before 37 weeks from the first day of last menstrual period. The high incidence of adverse prenatal outcomes may be contributed to the premature infants.

Aim of this study: is to evaluate the outcome of premature infants admitted to the neonatal intensive care unit.

Methodology: A cross sectional study was carried on 262 premature infants < 1 week admitted to Neonatal Intensive Care Unit in Pediatric Central Teaching Hospital in Baghdad and interviewed with mother by using detailed questionnaire.

Result: This study showed that the highest proportion of neonates was male (56.5%), bottle feeding (61.8%), and born to mothers aged between 20-29 years.

The highest death rates were found in infants with extremely low birth weight (43.8%) and below 30 weeks of gestation (37.3%).

Conclusion: the death was most frequently due to respiratory distress syndrome, the difference in proportions of death was statistically significant for birth weight and for gestational age.

KEYWORDS : premature infants (PM), neonatal intensive care unit (NICU), respiratory distress syndrome (RDS).

INTRODUCTION

The World Health Organization (WHO) has defined premature infants as live born infants delivered before 37 weeks from the first day of last menstrual period. recent data indicate that 1 in 10 infant around the world in 2010 were premature (1). In 2004, one in eight US births (12.4%) were preterm much higher than recorded in most European countries and double the proportion in Ireland, Finland and Greece (2). In 2010 the Preterm births per 100 births in Iraq was (6.5), in Jordan was (14.4), and in Oman was (41.3). (3)

Causes of Preterm Birth: Causes of preterm birth can be summarized into five large categories:

1) Fetal factors; Fetal distress, multiple gestation and Erythroblastosis fetalis (a hemolytic disease of the newborn infant occurs as a consequence of blood group incompatibility between mother and fetus). (4), (5), (6).

2) Placental factors; (placental dysfunction, placenta previa and abruption placentae are associated with preterm birth and bleeding). (7), (8), (9).

3) Uterine and cervical factors; uterine anomalies unicornuate, bicornuate & septate uterus, placental implantation associated with a uterine septum may also lead to preterm birth via antenatal placental separation and hemorrhage. (10), Cervical incompetence (11).

4) Maternal factors; hypertension disorders in pregnancy are considered to be one of the maternal diseases that may lead occasionally to preterm labor which is due to acute hypoxia or vasoconstrictive crisis that may elicit the production of preterm labor spontaneously in 75% of cases. (12), Heart disease, Anemia, and infection (13), (14).

5) Other factors; Polyhydramnios (excessive amniotic fluid), Premature rupture of membranes and Drugs abuse (e.g., cocaine) (15), (16), (17).

Neonatal problems associated with premature infants:

1-Respiratory: Respiratory distress syndrome. RDS: is the most common problem seen in premature infants. Babies born too soon

and have immature lungs that have not developed surfactant, a protective film that helps air sacs in the lung to stay open. (4) chronic lung disease of prematurity, pulmonary hemorrhage and apnea of prematurity (18) (19).

2-Cardiovascular system: patent ductus arteriosus and hypertension. (20)

3-Renal system: hyponatremia, hypernatremia, hyperkalemia and edema are the most common problems in premature infant with renal system disorders (4).

4-Hematological problems: anemia of prematurity and hyperbilirubinemia (21).

5-Metabolic-Endocrine problems: hypothermia, hypoglycemia, hyperglycemia and hypocalcemia. (4)

6-Congenital Malformation:

The incidence of congenital abnormalities increases as gestational age decreases & death from congenital malformations increases as the gestational age and birth weight decrease. (22).

Neonatal Diagnosis

Many of the problems associated with prematurity depend on how early the baby is born, and how much it weighs at birth, the most accurate way of determining the gestational age of infant in utero is calculating from a known date of conception or using ultra sound imaging to observe development (4)

Management: Skill resuscitation is essential in many of these babies; all necessary personnel and equipment must be available prior to delivery, special care is required to maintain a patent airway and avoid potential aspiration of gastric contents, Incubator care, heart rate, respiration monitoring, oxygen therapy, feeding and safeguards against infection (4).

Prognosis - It is found that Advances in medical care have made it possible for many premature infants to survive and develop normally, however, whether or not a premature infant will survive is still intimately tied to the gestational age. (22,23)

21 weeks or less 0% survival rate
 22 weeks, 0-10% survival rate
 23 weeks, 10-35% survival rate
 24 weeks, 40-70% survival rate
 25 weeks, 50-80% survival rate
 26 weeks, 80-90% survival rate
 27 weeks, the survival rate is greater than 90%.

Subjects and Methods

Study design:

It is a descriptive cross-sectional study.

Setting:

This study was carried out in neonatal intensive care unit (NICU) in children central teaching hospital

Time of study:

collection of data was carried out during period from first of February to the First of June 2016.

Sample size:

The study include 262 premature neonates.

Inclusion criteria:

1. Premature neonate, live born infant delivered before 37 weeks from the day of last menstrual period.

Exclusion criteria:

premature neonates whose information were incomplete.

Ethical consideration: This study was approved by the Scientific Council of Family Medicine. The permission to conduct the study was given by the manager of the hospital. Each mother was informed about the purpose of the study to ensure better response and verbal constant was taken from them.

Methods: The identification of gestational age was done depending on mother last menstrual period, gestational age values were used for identifying subjects whose mother didn't know their last menstrual period by ultrasound, and The study groups were followed until death or discharge from the hospital. Collection of data done by a especially designed questionnaire.

Limitation of the study: Short period of study, loss of neonates, and the study was carried out in one hospital.

Statistical analysis:-

Each patient assigned a serial identification number. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 20.

Distribution of these groups according to various variables studied and the association between these variables and outcome were tested.

The following statistical testes were employed, Chi-square test and fishers exact were used to assess the association between the categorical variables accordingly. A critical value of P<0.05 was used as the criterion for determining.

Results

Table(1) Fetal gender, type of feeding and maternal age. The highest proportion of neonates were males (56.5%), bottle fed (61.8%) and the maternal age was between (20-29) years (52.7%).

Gender		No.	%
	Male	148	56.5
	Female	114	43.5
Type of feeding	Breast	82	31.3
	Bottle	162	61.8
	Mixed	18	6.9

Maternal age	<20 years	77	29.4
	20 - 29 years	138	52.7 17.9
	<30 years	47	

Fig (1): Show the distribution of complications during hospitalization in premature group. The highest percent of complication in premature group was the RDS(86.6%).

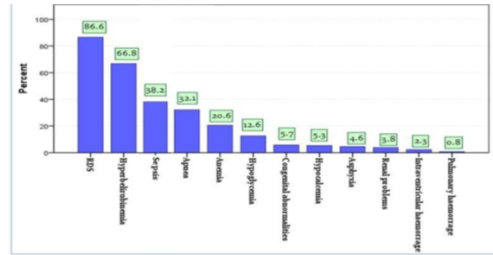


Table (2): Distribution of the study groups according to the outcome (their health status) on discharge.

outcome	No.	%
Survivals	203	77.5
Death	55	21.0
Discharged on parents responsibility	4	1.5

Note: we excluded 4 neonates from the premature group because they were discharged on the family responsibility.

Table (3): Relation between death rate and birth weight:

Birth-weight categories	Death		Total	P value
	No.	%		
Extremely low birth weight (<1000 g)	32	43.8	73	p<0.001
Very low birth weight (1000-1499 g)	11	20.8	53	
Moderately low birth weight (1500-1999 g)	7	11.7	60	
Border line low birth weight (2000-<2500 g)	5	6.9	72	

The highest proportion of death seen in extremely low birth weight (<1000 gm)

Table (4): Relation between death rate and gestational age:

Gestational age at delivery (weeks)	Death		Total	P value
	No.	%		
<30	44	37.3	118	< 0.001
31-33	3	5.2	58	
34-36	8	9.8	82	

The highest proportion of death (37.3%) occur in premature neonates below 30 weeks of gestation, and the lowest proportion of death (5.2%) occur 31-33 weeks of gestation, the difference in proportions shows a highly statistical significance (p < 0.001).

Discussion

Concerning the gender, the highest proportion for premature group was male. This study agree with a study done by Ramah (2010) in Saudi Arabia which showed that the highest proportion of premature babies was male (24).

Regarding types of feeding, this study shows that the highest proportion premature group was bottle feeding baby. This result could be due to the bad cultural background of the community, while the study done by Dip et al; (2000) found that breastfeeding is a possible cause for the majority of premature and low birth weight baby, regardless of the socioeconomic status. (25)

Regarding mother's age, this study showed that the highest proportion of the premature neonates born to a mothers aged between 20-29 years. This could be due to the poor socioeconomic

factors of the community. This agrees with a study done by Passini et al; (2016) in Brazil which showed that the highest proportion of premature neonates mothers aged between 20-34 years. (26).

Concerning the complications during hospitalization, this study showed that the highest proportion of complications in premature group was RDS (86.6%).

This agrees with a study done by Kunle et al; (2014) in Nigeria which showed also that the highest proportion of complications in premature neonates was RDS (68.8%). (27)

Regarding the relation between death rate and the birth weight, this study showed that the death rate increases as the birth weight decreases. This study showed a significant association between birth weight and death rate in the premature group.

A study done by Al-Sharabattii (2005) also showed a significant association between death rate and birth weight (28).

Death rate among babies < 1000g was 100%, 1000-1500g was 58.3%, while it was 22.9% (2000-2500g) and 14.3% (2000-2500g).

This study showed a significant association between death rate and gestational age (i.e. as the gestational age decrease, the death rate will increase), this result agrees with a study done by Al-Sharabattii (2005) which also found the presence of a significant association between death and gestational age (28).

Conclusions;

Highest rate of premature infants were males, bottle fed infant and those born to mothers aged between 20-29 years.

The death was most frequently due to respiratory distress syndrome with extremely low birth weight infants and of a gestational age below 30 weeks.

Regarding the relation between death and birth weight, there was a highly statistical significant between premature death and extreme low birth weight premature infants ($P < 0.001$).

The study found a statistical significance ($P < 0.001$) between premature death and infants below 30 weeks gestational age.

Recommendations

Physician should activate their health educational role towards the prevention of premature labor, clarify and treat underlying causes that bring down the incidence of premature infants.

Nurse working in NICS need continuous education about the neonatal outcome and about their role in guidance of premature infants parents.

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