A Survey Study of Cases Admitted to Neonatal Intensive Care Units of Obestetric and Gynecology Hospital Ain Shams University using the Egyptian Neonatal Network

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بسم الله الرحمن الرحيم

وقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ
ورَسُولُهُ والْمُؤْمِنُونَ

صدق الله العظيم

سورة التوبة آية (١٠٥)

*First, thanks are all due to **Allah** for Blessing this work until it has reached its end, as a part of his generous help throughout our life.*

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Amany Khalifa Abdel-Hamid

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List of Abbreviations

AAP	American Academy of Pediatrics
ABR	Auditory brainstem response
AGA	Appropriate for gestational age
ANC	Antenatal care
ANZNN	Australian and New Zealand neonatal network
APTT	Activated partial thromboplastin time
ASD	Atrial septal defect
BPD	Broncho pulmonary dysplasia
CHD	Congenital heart disease
CMV	Conventional mechanical ventilation
CNN	Canadian neonatal network
CNS	Central nervous system
CoNS	Coagulase negative staphylococci
CP	Cerebral palsy
CPAP	Continous positive airway pressure
CPAP	Continous positive pressure ventilation
CRP	C reactive protein
CS	Cesarean section
CSF	Cerebro spinal fluid
CTG	Cardiotocography
CVL	Central venous line
D١٠W	Dextrose ١٠٪
D٥W	Dextrose ٥٪
DIC	Disseminated intravascular coagulopathy
ECMO	Extracorporeal membrane oxygenation
ECOLI	Eschrecia coli
EGNN	Egyptian neonatal network
EGNNTP	Egyptian Neonatal Network for Training Pediatricians
ELBW	Extremely low birth weight
EMR	Electronic medical record
ESR	Erythrocyte sedimentation rate

List of Abbreviations (Cont.)

ETT	Endotracheal tnbe
EuroNeoNet	European neonatal network
FDP	Fibrin degradation products
FIO٢	Fraction of inspired oxygen
GBS	Group B Streptococci
GCMS	Gas chromatography mass spectrometry
GIT	Gastrointestinal tract
HFJV	High frequency jet ventilation
HFOV	High frequency oscillatory ventilation
HIE	Hypoxic ischemic encephalopathy
HMD	Hyaline membrane disease
IC Hge	Intracranial hemorrhage
ICD	International Classification of Diseases
ICT	Intrecostal tube
IDMs	Infant of diabetic mothers
IEM	Inborn errors of metabolism
INR	International normalized ratio
IRDS	Infant respiratory distress syndrome
IUGR	Intrauterine growth restriction
IV	Intravenous
IVH	Intra ventricular hemorrhage
IVIG	Intravenous immune globulin
LBW	Low birth weight
LGA	Large for gestational age
LOS	Length of stay
MAS	Meconium aspiration syndrome
MCRN	Medicine for children research network
MRSA	Methicillin Resistant Staphylococcus Aureus
NEC	Necrotizing enterocolitis
NICU	Newborn intensive care unit
NMR	Neonatal mortality rate
NPO	Nil per os
NRP	Neonatal resuscitation program

List of Abbreviations (Cont.)

PDA	Patent ductus arteriosus
PICC	Percutaneous inserted central line
PPHN	Persistent pulmonary hypertension
PI	Pondral index
PROM	Premature rupture of membranes
PT	Prothrombin time
RBC	Red blood corpuscle
ROP	Retinopathy of prematurity
RLF	Retrolental fibroplasia
SNS	Saudi neonatal network
SGA	Small for gestational age
SIMV	Synchronized Intermittent Mandatory Ventilation
TORCH	Toxoplasma, Rubella, Cytomegalo virus, Herpes
TTN	Transient tachypnea of newborn
TGA	Transposition of great vessels
UVC	Umbilical venous catheter
UKCRN	United kingdom clinical research network
UNICEF	United nations children's fund
USA	United States of America
VSD	Ventricular septal defect
VLBW	Very low birth weight
WHO	World health organization

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Introduction

While high infant mortality rates were recognized by the British medical community at least as early as the ١٨٦٠s, modern neonatal **intensive** care is a relatively recent advance. ***(Lee, ١٨٩٨)*** established the first premature infant incubator station in Chicago, Illinois. The first American textbook on prematurity was published in ١٩٢٢ ***(Baines, ٢٠٠٧)*.**

It was not until ١٩٦٥ that the first American newborn intensive care unit (NICU) was opened in New Haven, Connecticut and in ١٩٧٥ the American Board of Pediatrics established sub-board certification for neonatology ***(American Academy of Pediatrics, ٢٠٠١)*.**

This entry gives the number of deaths of infants under one year old in a given year per ١،٠٠٠ live births in the same year; included is the total death rate, and deaths by sex, *male* and *female*. This rate is often used as an indicator of the level of health in a country ***(CIA World Factbook, ٢٠١٢)*.**

Infant mortality rate *in Egypt:* ٢٥,٢٠ deaths/١،٠٠٠ live births ***(Korotayev and Zinkina, ٢٠١١)*.**

Total: ٢٤,٢٣ deaths/١،٠٠٠ live births.
Male: ٢٥,٨ deaths/١،٠٠٠ live births.
Female: ٢٢,٥٩ deaths/١،٠٠٠ live births.

(CIA World Factbook ٢٠١٢).

Neonatal mortality rate:

The statistical rate of infant death during the first ٢٨ days after live birth, expressed as the number of such deaths per ١٠٠٠ live births in a specific geographic area or institution in a given time ***(Mosby's Medical Dictionary, ٨th Edition © ٢٠٠٩, Elsevier)*.**

The neonatal mortality rate (NMR) was ٢٥ per ١٠٠٠ live births (١٧ early and ٨ late). Half the deaths occurred in the first two days of life. Neonatal causes of death were prematurity (٣٩٪), asphyxia (١٨٪), infections (٧٪), congenital malformation (٦٪) and unclassified (٢٩٪) ***(Campbell et al., ٢٠٠٤)***.

Aim of the Work

The aim of the study is to make a survey of the cases admitted to neonatal intensive care unit, Obstetrics and Gynecology Hospital, Ain-Shams University, using the Egyptian Neonatal Network in order to establish and maintain database of neonates which will be a basis for quality improvement and management at our neonatal intensive care unit and so help for policy planning and development.

High Risk Neonates

Definition:

The high-risk neonate is defined as a newborn, regardless of gestational age or birth weight, which has a greater-than average chance of morbidity or mortality, usually because of conditions or circumstances superimposed on the normal course of events associated with birth and the adjustment to extrauterine existence. The high-risk period begins at the time of viability (the gestational age at which survival outside the uterus is believed to be possible, or as early as ٢٣ weeks of gestation) up to ٢٨ days after birth and includes threats to life and health that occur during the prenatal, perinatal, and postnatal periods ***(Askin and Wilson, ٢٠٠٩).***

Classification according to:

A. Birth weight:

١. Extremely low birth weight:

An extremely low birth weight (ELBW) infant is defined as one with a birth weight of less than ١٠٠٠g (٢lb, ٣oz). Most extremely low birth weight infants are also the youngest of premature newborns, usually born at ٢٧ weeks' gestational age or younger ***(Martin et al., ٢٠٠٦).***

Survivability correlates with gestational age for infants who are appropriate for gestational age (AGA). In ٢٠٠٢, the first-year survival rate was ١٣,٨٪ for infants with a birth weight of less than ٥٠٠ g, ٥١٪ for infants with a birth weight of ٥٠٠-٧٤٩ g, and ٨٤,٥٪ for infants with a birth weight of ٧٥٠-١٠٠٠ g. Infants with ELBW are more susceptible to all of the possible complications of premature birth, both in the immediate neonatal period and after discharge from the

nursery. Although the mortality rate has diminished with the use of surfactants, the proportion of surviving infants with severe sequelae, such as chronic lung disease, cognitive delays, cerebral palsy, and neurosensory deficits (i.e., deafness and blindness), has not. Although improved neurodevelopmental outcomes have been reported in a few small studies, such improvement has not been seen on a global scale ***(Subramanian et al., ٢٠١٢).***

Extremely low birth weight children have very high rates of chronic conditions compared with children born at normal weight. These conditions include asthma, cerebral palsy, and visual disability, as well as poorer cognitive ability, academic achievement, motor skills, and social adaptive functioning & although extremely low birth weight children constitute less than ١٪ of babies and thus the societal impact is not enormous, the effect on families is enormous ***(Mayor, ٢٠٠٥).***

Congenital infection is the leading cause of death in extremely low birth weight infants ***(Hodgman, ٢٠٠٣).***

٢. Very low birth weight:

Very low birth weight (VLBW) is a term used to describe babies who are born weighing less than ١،٥٠٠ grams (٣ pounds, ٤ ounces). Only a few babies, ١،٥ percent, are born this tiny. However, the overall rate of very low birth weight babies in the US is increasing. This is primarily due to the greater numbers of multiple birth babies who are more likely to be born early and weight less ***(Freeman, ٢٠١٠).***

The primary causes of VLBW are premature birth (born <٣٧ weeks gestation, and often <٣٠ weeks) and intrauterine growth restriction (IUGR), usually due to problems with placenta, maternal health, or to birth defects, other factors that can contribute to the risk of VLBW include: **Race:** African-