IMPORTANT IATROGENIC DISORDERS THAT MAY COMPLICATE MEDICAL PROCEDURES DURING MANAGEMENT OF NEONATES AT RISK IN NEONATAL INTENSIVE CARE UNITS

ESSAY
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" بسم الله الرحمن الرحيم "

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صدق الله العظيم

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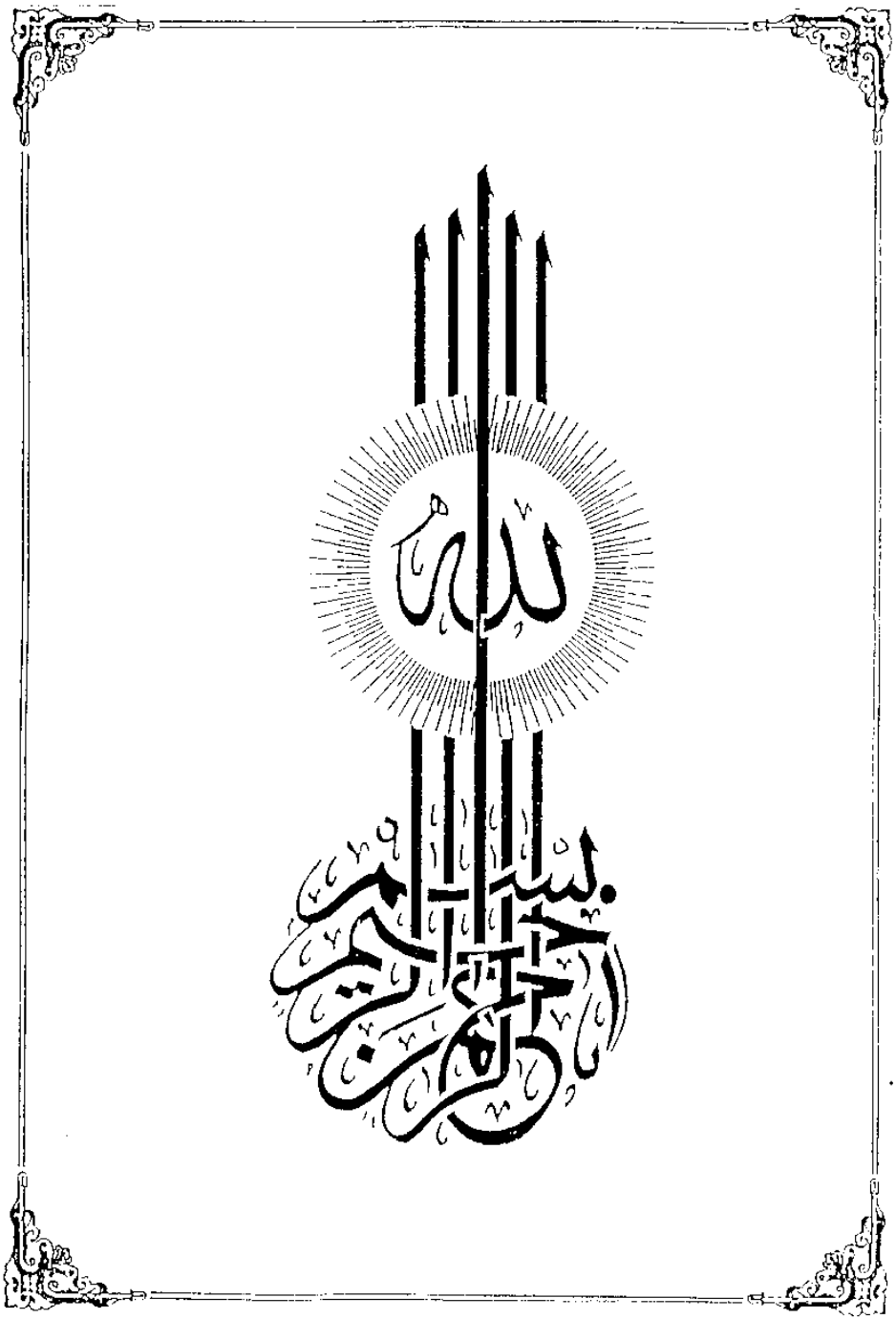

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1993

TO...

MY FAMILY

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CHAPTER (I)
INTRODUCTION AND A SHORT HISTORICAL ACCOUNT

INTRODUCTION INCLUDING A HISTORICAL ACCOUNT

Neonatal intensive care (NIC) is a relatively recent development. It probably started in the 1940s, with the introduction of modern incubators, as prior to that, very little was done for the newborn at risks.

In 1930s a primitive incubator was used. It resembled the lower half of the boiler used to wash clothes at an earlier era. Heat was supplied by hot water and oxygen (O_2) could be piped into the incubator, but its cover was so poorly fitted and so was often left off, and so, was impossible to achieve high concentrations of oxygen. It was this defect which spared many infants from retrolental fibroplasia (RLF).

Hemorrhagic diseases of the newborn were very common conditions that troubled paediatricians in 1940s, and its prevention was simply carried out by adminstration of whole blood intramuscularly. By that time, there was no awareness of the Rh factor. Consequently, numerous Rh negative female newborns were sensitized to the Rh factor and these upon

reaching child bearing age, give birth to a first child with full blown erythroblastosis foetalis.

It was not before 1944 that vitamin K started to be routinely given prophylacticaly to hypoprothrombinemia of the newborn, and it was not untile the late 1950s and the early 1960s that it became known that water soluble vitamin K could, in large doses, produce hemolysis of RBCs and thus increase hyperbilirubinemia and kernictrus. It took some time to learn that 1-2 mg of vitamin K are sufficient for the newborn.

The most frightening iatrogenic disorder which started to emerge with the development of neonatal intensive care units (NICUs) and the improvement in survival rate among low birth weight infants (LBWI) is retrolental fibroplasia (RLF) or "Bosten Disease". Dr. Terry is the ophthalmolgist who first described the disease in 1942. He noted an infant with leukokoria and found that his lens was clear but that there was a dense fibrovascular mass involving the posterior chamber.

Great interest in the etiology of RLF brought numerous speculations. Terry belived that the main cause was precoucious exposure to light. However, the early observation that this

disorder was pronounced with the free use of O2 and the applications of new equipments, which permitted high O2 concentration. In the period between 1952-1957 increased number of controled studies confirmed that oxygen is the important factor in the pathogenesis of retinopathy of prematurity (ROP) and RLF, particularly when adminstered in high concentration for longer period of time.

Another scourge of the early liberal use of oxygen for management of respiratory problems, particularly hyaline membrane disease (HMD), together with the wide spread use of assisted ventilation and endotracheal intubation in NICUs, is a condition known as bronchopulmonary dysplasia (BPD) or "the respiratory lung", which was first described by Northway, Rosan, Porter (1967).

No body knows exactly when necrotizing enterocolitis (NEC) has been observed. The early practice of shifting from with holding caloris from the sick neonate to offering him hyperosmolar feeding an attempt to arrive at an optimum nutrition seemed to contribute to the development of NEC. Later on, the presence of NEC was related to certain nursing procedures, particularly umbilical artery catheterization.

In 1970, neonatal jaundice was treated with phototherapy, but this was reported to cause damage to the eyes and/or dehydration (Lucky Jain and vidyasager, 1989).

In 1980s, the use of extracorporeal membrane oxygenation (ECMO) was started for the management of respiratory failure in the neonates. Some iatrogenic disorders were reported to occur secondary to this procedure including haemorrhages, neurologic affections and renal failure (Gerroughty and Yonnie, 1987).

In 1983, Metaly et al., noted that necrotizing tracheobronchitis (NTB) may result from the use assisted ventilations with endotracheal intubation used for treatment of RDS (Lucky, Vidyasager, 1989).

CHAPTER (II)
IATROGENIC DISEASES THAT MAY COMPLICATE ASSISTED PULMONARY VENTILATION AND/OR OXYGEN THERAPY

IATROGENIC DISEASES THAT MAY COMPLICATE ASSISTED PULMONARY VENTILATION AND/OR OXYGEN THERAPY

These include:

1. Pulmonary Complications:

i. Bronchopulmonary Dysplasia (BPD).

ii. Acute Intersticial Emphysema (AIE)..

iii. Air Leak Syndromes namely pneumothorax, Pneumomediastinum, Pneumopericardium, Pneumoperitoneum.

iv. Persistant Intersticial Emphysema (PIE).

v. Air Embolism.

vi. Necrotising Tracheobronchitis (NTB).

2. Extrapulmonary Complications:

Retinopathy of prematurity and retrolental fibroplasia.

1. PULMONARY COMPLICATIONS

i. Bronchopulmonary Dysplasia (BPD)

The incidence of BPD is not known with certainty. However the risk of development of BPD is strongly related to gestational age and is also greatly influenced by the presence or abscence of respiratory distress syndrome (RDS). Studies on infants with birth weights less than 1.5 kgm reported a 20 to 40% incidence and for weights less than 1 kgm, it reached 70% *(Toce et al., 1984).*

In a survey of 8 neonatal units performed between 1982 and 1984 involving 1625 newborns with birth weights less than 1.5 kgm the incidence inrelation to the weight was as given in table (1):

Birth wt. ingm.	% with BPD
701-800 gm	76.1%
801-900 gm	68.3%
901-1000 gm	46.0%
1001-1250 gm	26.0%
1251-1500 gm	12.9%

Avery et al., (1987)