GASTROINTESTINAL SURGERY OF THE NEWBORN

ESSAY

Submitted for Partial Fulfilment of

The Master Degree in Pediatrics

Presented by

GEHAYER KAMAL EL-DIN

M.B,B.Ch., Ain Shams University

(December, 1990)

Under Supervision of

PROFESSOR DR. SANAA ABDEL RAHMAN

Professor of Pediatrics

Faculty of Medicine - Ain Shams University

DR. AHMED MEDHAT ZAKI

Lecturer of Pediatric Surgery

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

1995

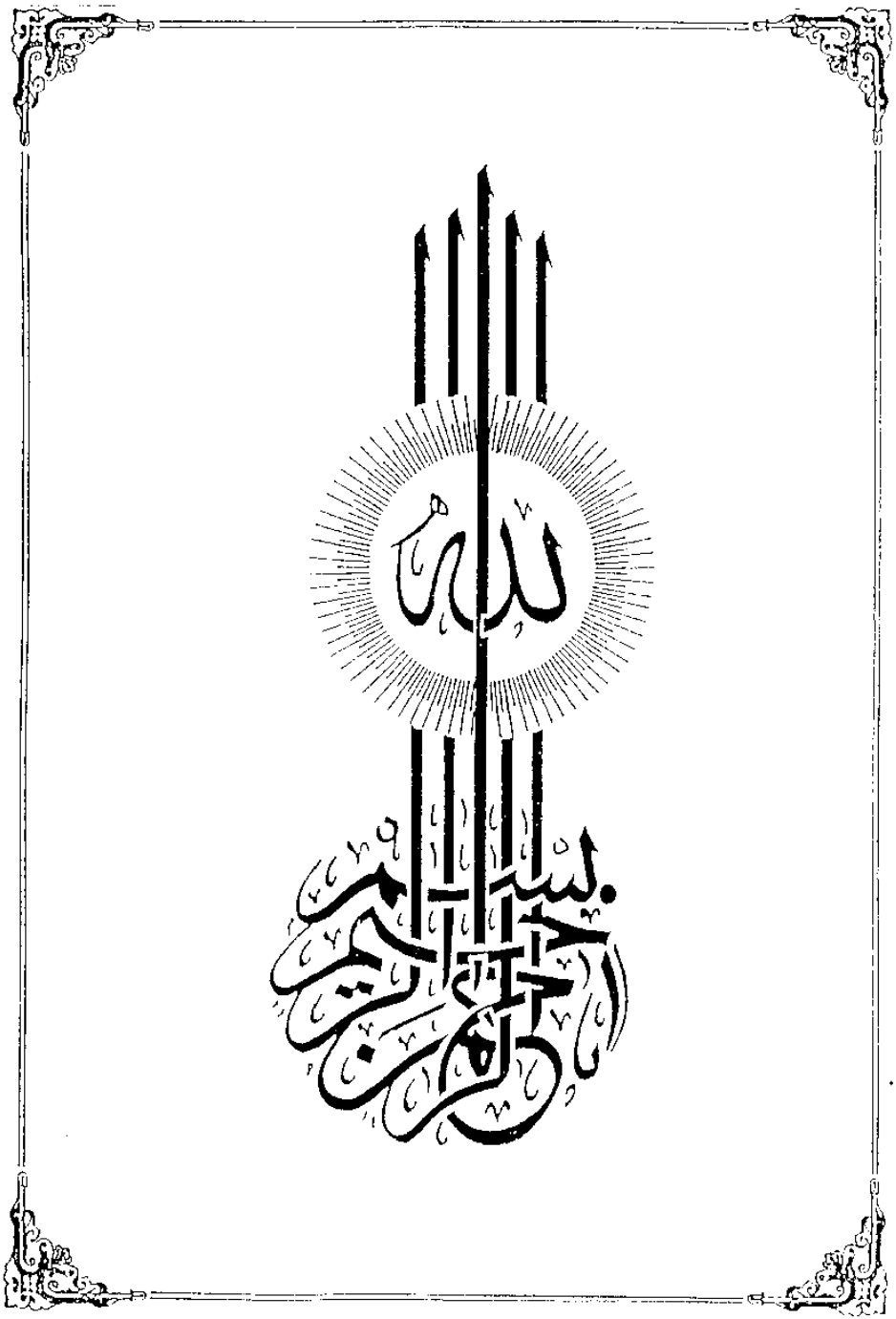
بسم الله الرحمن الرحيم

ويسألونك عن الروح

قل الروح من أمر ربي وما أوتيتم من العلم إلا قليلا

الإسراء ٨٥

صدق الله العظيم



To ...

The memory of my father.

To ...

My beloved mother, husband and son.

ACKNOWLEDGEMENTS

I would like to express my profound and sincere appreciation to ***Professor Dr. Sanaa Abdel Rahman****, Professor of Pediatrics, Ain Shams University, for her continuous encouragement, meticulous supervision, sound criticism and enthusiastic help that made this work possible.*

I was fortunate to carry out this work under the guidance of **Dr. Ahmed Medhat Zaki***, Lecturer of Pediatric Surgery, Ain Shams University, who offered me much of his time and experience.*

I would like to show my appreciation to the staff members of our NICU, Ain Shams University. They taught me a great deal of neonatal work.

Finally, I would like to thank my family, friends and colleagues for their kind support during the accomplishment of this work.

Gehayer Kamal

CONTENTS

LIST OF TABLES

List of Figures

LIST OF ABBREVATIONS

CDH	=	Cougenital diaphragmatic hernia
EA, TEF	=	Esophageal atresia & tracheo-esophageal fistula
PPHN (PFC)	=	Persistent pulmonary hypertension of newborn, also termed (persistent fetal circulation)
RDS (HMD)	=	Respiratory distress symdrome, also termed (hyaline membrane disease)
PH	=	Pulmonary hypoplasia
PVR	=	Pulmonary vascular resistance
ECF	=	Extracellular fluid
ICF	=	Intracellular fluid
IVH	=	Intraventricular hemorrhage
PDA	=	Patent ductus arteriosus
IWL	=	Insensible water loss
(V) LBW	=	(very) low birth weight
OG	=	Orogastric
NEC	=	Necrotizing enterocolitis
T (PN)	=	Total (parenteral nutrition)
NILVs	=	Neonatal intensive care unit(s)
VDs	=	Vasodilator(s)
VSD	=	Ventricular septal defect
GIT	=	Gastrointestinal tract
IV(F)	=	Intravenous (fluids)
CVP	=	Central venous pressure
CVCs	=	Central venous catheters
US	=	Ultrasound

HD	= Hirschsprung's disease
ARM	= Anorectal malformations
TCA	= Total colonic agangluonosis
NF	= Neurofilament proteins
PC	= Pubococcygeal
CS	= Cesserian section
LGA	= Large for gestational age
SGA (IUGR)	= Small for gestational age or (Intrauterine growth retardation)
ECMO	= Extracorporeal membrane oxygenation
IPPV	= Intermittent positive pressure ventilation
DIC	= Dissiminated intravascular coagulopathy
FFP	= Fresh frozen plasma
PGs	= Prostaglandins
CVS	= Cardiovascular system
L/S	= Lecithin / sphingomyelin ratio
PG	= Phosphatidyl glycerol
PR	= Rectal examination
BWS	= Becwith - Wiedenman syndrome
NE	= Neuroendocrine
ACHE	= Acetyl choline esterase
CHO	= Carbohydrate
PAP	= Pulmonary artrey pressure
TPG	= Transpulmonary pressure gradient
ADH	= Antidieuretic hormone

LIST OF SYMBOLS

Ca^{+}	=	Calcium
Mg^{+}	=	Magnesium
Na^{+}	=	Sodium
K^{+}	=	Potassium
H^{+}	=	Hydrogen
Cl^{-}	=	Chloride
HCO_3^{-}	=	Bicarbonate
PO_4^{-}	=	Phosphate
O_2	=	Oxygen
PaO_2	=	Arterial partial pressure of oxygen
PCO_2	=	Carbon dioxide partial pressure
FIO_2	=	Fractionated inspired oxygen
mg	=	Milligram
kg	=	Kilogram
mEq	=	Milliequivalent
dL	=	Deciliter
mmHg	=	Millimeter mercury
Hct	=	Hematocrite
Hb	=	Hemoglobin

Two to the percent of all babies are born with major congenital malformations, surgery will be required for most of these defects (*Lister*, 1990).

During this century congenital malformations have increased in importance as a cause of perinatal and neonatal morality, this is not because malformations have increased in frequency but because other causes of infant death such as infection, poor nutrition and perinatal asphyxia have been controlled. Thus, in 1920 1 in 30 infant deaths were due to a malformation, whereas it is now about 1 in 4 (*Buyse*, 1991).

The spectacular development of neonatology in general and neonatal surgery in particular has enabled us to save an ever increasing number of newborn infants suffering from severe congenital malformations, e.g. between 1970-1980 the neonatal mortality of otherwise normal infants was almost halved. This could not be achieved unless there is harmony and cooperation between neonatologist, neonatal surgeons, anesthesiologists, equipments and specially a nursing staff skilled in this type of work (*Byrne*, 1991).

Neonatologists have also been instrumental in changing the workload of neonatal surgical units, not only they have increased to a significant extent the survival of LBW babies with multiple congenital anomalies, hence their referral for surgical correction, but they have

also produced a new population of survivors suffering from disease which may require surgical correction e.g. NEC (*Lister*, 1990).

In this study we concentrate entirely on the common GIT emergencies of the newborn, as these represent the major part of neonatal surgical emergencies, namely:

1. Esophageal atresia and tracheoesophageal fistula.
2. Congenital diaphragmatic hernia.
3. Gastric outlet obstruction and pyloric stenosis.
4. Intestinal obstruction.
5. Duodenal atresia and stenosis.
6. Malrotation and volvulus.
7. Necrotizing enterocolitis.
8. Neonatal Hirschsprung's disease.
9. Duplication of the alimentary tract.
10. Umbilical abnormalities: omphalocele and gastroschisis.
11. Anorectal malformations.
12. Liver and biliary tract.

This subject is so important and life-threatening as to merit a separate detailed study of each disease regarding: embryological background, etiology, clinical presentation and recent trends in the management.

In NICUs, some cases may be neglected due to late diagnosis, wrong diagnosis, atypical presentation or inadequate preoperative preperation and these cases carry bad prognosis (*Cook*, 1990).

The Aim of this Essay is:

- To Review recent literatures of the gastrointestinal surgical diseases of the newborn and highlight recent topics in the diagnosis and treatment of these diseases.
- Suggest a policy by which we can:
  - Reach early and prompt diagnosis.
  - Select cases for surgery.
  - Establish meticulous pre-operative preparation and postoperative care.

Thus, avoiding neglected cases, improving the survival and decreasing the morbidity and mortality of the newborn due to correctable surgical causes.

Review of Physiology