ABDOMINAL ULTRASOUND IN EARLY DIAGNOSIS OF NECROTIZING ENTEROCOLITIS

Thesis submitted for partial fulfillment of master degree in

Pediatrics

BY

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Acknowledgement

First and foremost I would like and have to thank and praise God for his blessing and help along the long way of coming where I am today.

I would like to express my sincere thanks and extreme gratitude to **Dr.Safaa Shafik Emam,**Prof. of Pediatrics,Faculty of Medicine – Ain Shams University for her great support, supervision, suggestion and guidance throughout this work.

I would like to thank and express my great indebtedness to **Dr.Maha Hassan Mohamed,** Ass .Prof. of Pediatrics,Faculty of Medicine – Ain Shams University for selection of the subject, her close supervision, clarification, suggestion and scientific help taking much of her time and effort.

I would like to express my deep appreciation to **Dr.Sherine Kadry Amin,**Ass.Prof. of radiology, Faculty of Medicine – Ain Shams University, for her generous support, meticulous supervision, her cooperation and guidance consuming much of her time and effort.

I would like to thank **Dr Ihab Alhakim** Prof. of Pediatrics Faculty of Medicine – Ain Shams University, for his great effort on my statistics and the final outcome of the work.

I would like to thank parents of patients for their generous cooperation and acceptance of work.

Dedication

I would like to thank my parents, my family especially my wife, and all my colleagues for their support and tolerance.

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Arabic Summary

List of abbreviations

AXR: abdominal x ray.

Ca: Calcium.

cm: centimeter.

E. coli: Escherichia coli.

E.L.B.W.: extremely low birth weight infants.

GIT: gastrointestinal tract.

H: hour.

I/R: ischemia and reperfusion injury.

IgA: Immunoglobulin A.

IgG: Immunoglobulin G.

IL – Ira: interleukin I receptor antagonist.

IL: interleukin.

IM: intramuscular.

iNOS: inducible iso-form of nitric oxide synthase.

IV: intravenous.

K: Potassium.

kg: kilogram.

L: litter.

LUAC: low set umbilical arterial catheter.

mg: milligram.

ml: millimeter.

mmHg: millimeter mercury.

mRNA: messenger RNA.

-ve: negative.

Na: Sodium.

NEC: Necrotizing entercolitis.

NICUs: Neonatal Intensive Care Unit.

NO Synthase: nitric oxide synthase.

NO: Nitric Oxide.

Numb: number.

+ve: positive.

PAF: Platelet Activating Factor.

PAF-AH: Platelet Activating Factor-acetylhydrolase.

PDA: patent ductus arteriosus.

Perc: percentage.

PROM: premature rupture of membranes.

RCT: randomized controlled trial.

RDS: Respiratory Distress Syndrome.

RHIL 10: recombinant human interleukin 10.

SGA: small for gestational age.

SIRS: Systemic inflammatory response syndrome.

staph.: Staphylococcus.

TNF: Tumor Necrotizing Factor.

U.S.A: United States of America.

UAC: umbilical arterial catheter.

UK: United Kingdom.

V.L.B.W.: very low birth weight.

Vit.: vitamin.

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Introduction

Necrotizing enterocolitis (NEC) is the most common acquired gastrointestinal disease among newborns; affecting 1% to 5% of infants requiring neonatal intensive care and resulting in approximately 3000 deaths per year **(*Lee and Polin,2003).***

Infants weighing between 500 and1500 grams at birth and born before 28 weeks gestation constitute most NEC patients at many institutions and have thus been identified at highest risk of developing the disease ***(Chandler et al.,2000).***

Mortality secondary to NEC in the preterm infants population weighing less than 1000 grams ranges from 35% to 50%. Infants who develop NEC are at increased risk of death , infection, and long term health consequences that include bowel stricture , fistula , abscess, recurrent NEC, short-gut syndrome and complications related to long term total parenteral nutrition ***(Bisquera et al., 2002).***

Retrospective surveys have identified numerous risk factors for the development of NEC including umbilical vessel catheterization **(*McComrmack et al .,1987),*** hypoxaemia and hypotension **(*Bunton ,1997)*** , intrauterine growth retardation **(*Baschat et al., 2007)*** and prematurity ***(Hsueh et al .,2003)***. In term infants , underlying congenital heart disease has been identified as a major risk for the development of NEC ***(Ostlie et al ., 2003).***

Fever, Neutropenia, abdominal pain,and diarrhea are common manifestations of enterocolitis , and clinical signs and symptoms range from mild evidence of septicemia to perforation . Physical examination findings may range from mild abdominal pain to point tenderness, peritoneal inflammation signs, and homodynamic shock ***(Van de Wetering et al .,2003).***

In addition to suggestive clinical scenario, imaging is required to further corroborate the diagnosis of NEC, because other gastrointestinal disorders can have similar presentations (e.g. diverticulitis, appendicitis, tubulo-ovarian abcess, or cholecystitis) ***(Buchheidt et al.,2003).***

The important benefit of ultrasonography. in oure series is that it is more sensitive than plain radiography in early stage. we can detect bowel abnormalities suggestive of pneumatosis intestinalis on ultrasonography in patient with early stage of NEC by demonstrating acrogenic dots or dense granular echogenicites in the bowel wall **(Goske , Goldblum , Applegate ,et al.,1999).**

It can also be done bedside and does not need transport of the patient especially critically ill patient compared to CT.

It can also be repeated with out exposure to ionizing radiation , so it can be used in the follow up and monitoring of the case.

It also can be useful in deciding adequate time for reinitiating and advancement of feeding during the follow up of NEC patients.