COMPARATIVE STUDY BETWEEN LAMELLAR BODY COUNTS AND SHAKE TEST FOR DETECTION OF FETAL LUNG MATURITY

A THESIS
SUBMITTED FOR PARTIAL FULFILLMENT
OF MASTER DEGREE IN OBSTETRICS AND GYNECOLOGY

By

Amel Mohamed Safwat Hashem

M.B.B.Ch. (Ain Shams University, 1992)

Resident of Bolak General Hospital

Supervised by

Prof. Dr. Mohamed Nagi El-Makhzangi

Professor of Gynecology and Obstetrics

Faculty of Medicine

Ain Shams University

Dr. Khalid Hassan Swedan

Lecturer of Gynecology and Obstetrics

Faculty of Medicine

Ain Shams University

Dr. Hoda M. El-Gendy

Lecturer of Clinical Pathology

Faculty of Medicine

Ain Shams University

1997

بسم الله الرحمن الرحيم

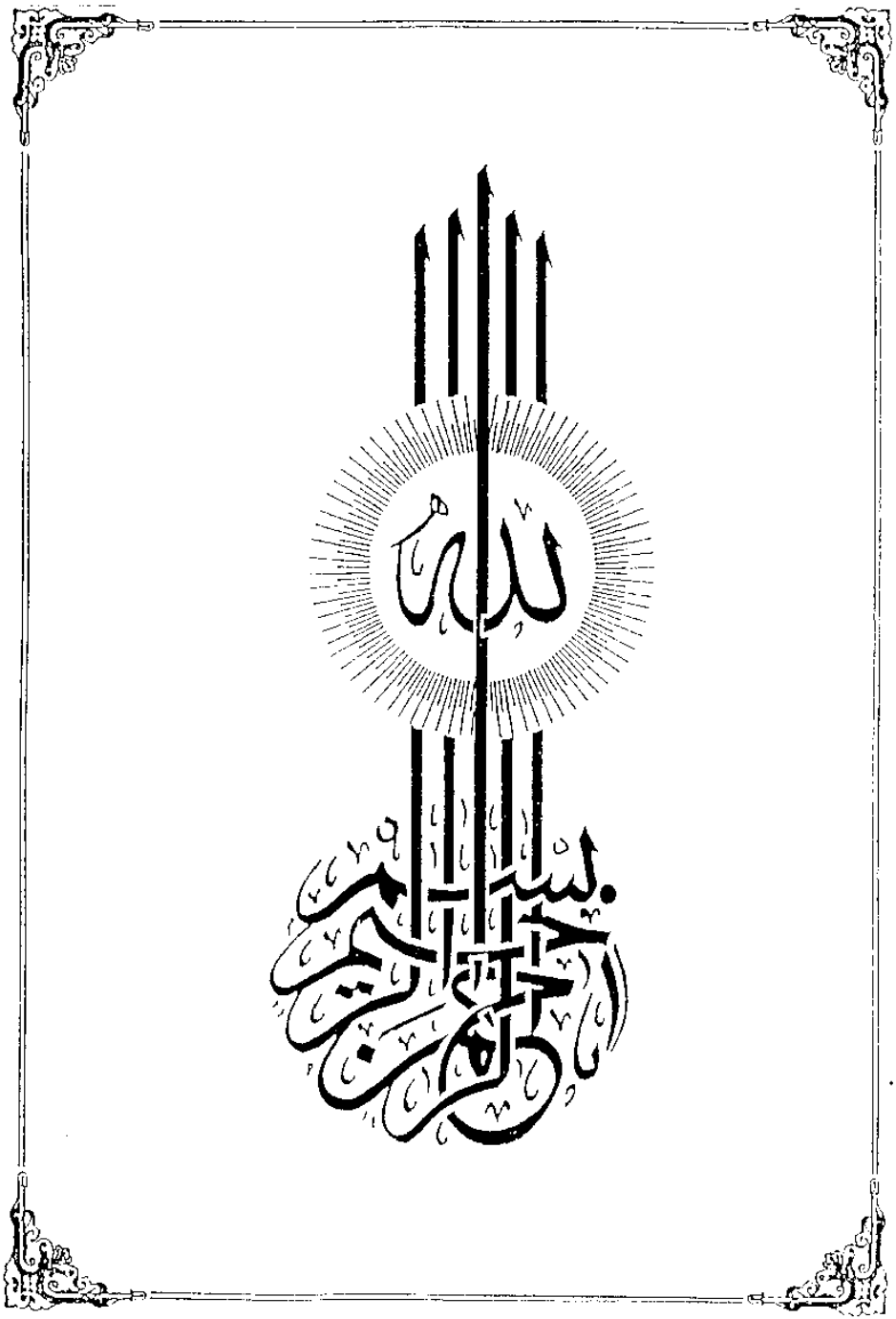
قالوا سبحانك لا علم لنا

الا ما علمتنا إنك أنت

العليم الحكيم

صدق الله العظيم

سورة البقرة آية رقم ٣٢



ACKNOWLEDGEMENT

I wish to express my deep thanks and gratitude to Professor Dr. ***Mohamed Naggi El Makhzangi***, Professor of Gynecology and Obstetrics, Ain Shams University for his valuable supervision and guidance.

I would like to thanks Dr. ***Khalid Hassan Swedan,*** Lecturer of Gynecology and Obstetrics, Ain Shams University for his sincere help, support and encouragement throughout my work.

I would also like to thank Dr. ***Hoda Mohamed El-Gendy*** for her kind help and effort.

Iam also sincerely thankful to all staff members of all units of Obstetrics and Maternity, Ain Shams University Hospital.

My thanks to the staff members of Ultrasound Unit , Obstetrics and Maternity, Ain Shams University Hospital for their cooperative help.

Also my thanks to the staff members of Haematological Laboratory Departement, Obstetrics and Maternity, Ain Shams University Hospital for their cooperative spirit and help in referring the samples.

Also my thanks to all staff members of Neonatal Intensive Care Unit, Obstetrics and Maternity, Ain Shams University Hospital for their cooperative help in following up the neonatal outcomes.

My deepest gratitude to the patients for their great assistance and cooperation, also my deepest gratitude to my family and friends for their great assistance and moral support until this work was finished.

LIST OF TABLES

LIST OF ABBREVIATIONS

ACOG= American College of Obstetrics and Gynecology.
BPD = Bronchopulmonary dysplasia.
BST = Bubble stability test.
CCF = Congenital cyanotic heart disease.
CDP = Continuous distending pressure.
CL = Lung compliance.
CNP = Continuous negative pressure.
CPAP= Continuous positive airway pressure.
CPDA= Citrate phosphate dextrose-adenine.
CXR = Chest X ray.
DIC = Disseminated intravascular coagulopathy.
DPH = Diphenyl hexatriene.
DPL = Dipalmitoyl lecithin.
ECG = Echocardiography.
ETT = Endotracheal tube.
FRC = Functional residual capacity.
HMD = Hyaline membrane disease.
IPPV = Intermittent positive pressure ventilation.
L/S = Lecithin sphingomyelin ratio.
LBCs = Lamellar body counts.
LP = Lumbar puncture.
NAD = No abnormality detected.
NBD-PC= Palmitoyl (nitro-benzoxadiazol) aminocaproyl phosphatidyl choline.
NEC = Necrotizing enterocolitis.
PaCO2= Arterial pressure CO2.
PAO2 = Arterial pressure of oxygen.
PCV = Central venous pressure.
PDA = Patent ductus arteriosus.
Ph-G = Phosphatidyl glycerol.

PPF =Plasma protein fraction.
PT = Prothrombin time.
PTT = Partial thromboplastin time.
PVH = Periventricular haemorrhage.
QC = Pulmonary capillary blood flow.
R_{AW} = Airway resistance.
RDS = Respiratory distress syndrome.
REM = Rapid eye movement.
R_L = Pulmonary resistance.
SG_{AW}= Specific conductance of airway.
SPA =Surfactant protein A, B & C.
TGV = Thoracic gas volume.
THAM= Trishydroxymethyl-amino-methane.
TLC = Total lung capacity.
TRH = Thyrotropic releasing hormone.
TTN = Transient tachypnea of the newborn.
UAC = Umbilical artery catheter.
V_A = Alveolar volume.
V_C = Vital capacity.
V_D = Dead space.
V_T = Tidal volume.
WHO = World Health Organization.

LIST OF FIGURES

INTRODUCTION

INTRODUCTION

Respiratory distress syndrome remains a common cause of neonatal mortality. Consequently, fetal lung maturity testing plays an important role in establishing the obstetric management strategies. Predicting maturity of the fetal lung is important in many obstetric situations, including premature labour, premature rupture of membranes, management of pre-eclampsia, fetal distress and elective delivery at term ***(Carlos et al., 1995).***

Many laboratory tests using amniotic fluid have been used or advocated for predicting fetal lung maturity. Tests useful for predicting fetal lung maturity include lecithin, sphingomyelin ratio, phosphatidyl glycerol, foam stability index, fluorescence polarization, absorbance at 650 nm. All measure some aspect of surfactant contained in the amniotic fluid, none is perfect at classifying lung maturity, and the turn around time varies from 10 minutes to 4 hours. The L/S ratio is available only at large hospitals or at referance laboratories. A rapid test available at all hospitals would be very useful for the management at high risk pregnancies and for delivery decision needed at term ***(Edward et al., 1993).***

Lamellar body counting is rapid and has been proposed for several groups as a potential fetal lung maturity. Pulmonary surfactant is synthesized in the alveolar type II granular pneumocytes and packed as lamellar bodies that are 1-5 μm in diameter.

These surfactant storage granules contains phospholipids, cholesterol, and several surfactant-specific proteins. Lamellar bodies first appear in the cytoplasm of fetal pneumocytes between 20-40 weeks gestation. The lamellar bodies become numerous and are continuously secreted into the fetal alveoli. Fetal breathing movements and net exudation of the fluid carry these lamellar bodies into the amniotic fluid. The laminations within the particles slowly change into a structure described as tubular myelin. Surfactant particles are easily demonstrated in the amniotic fluid using electron microscopy. Several investigators suggested that counting these particles would be useful in predicting fetal lung maturity ***(Palmer et al.,1993).***