

**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 GYNCOLOGY**

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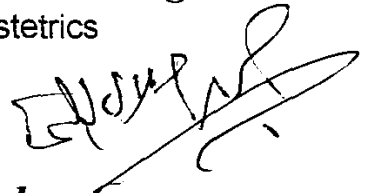
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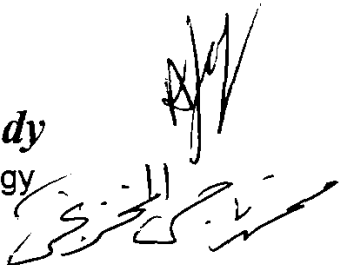
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بسم الله الرحمن الرحيم

**قالوا سبحانك لا علم لنا**

**إلا ما علمتنا إنك أنت**

**العليم الحكيم**

صدق الله العظيم

سورة البقرة آية رقم ٣٢



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## 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.  
PaCO<sub>2</sub>= Arterial pressure CO<sub>2</sub>.  
PAO<sub>2</sub>= 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.

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# INTRODUCTION

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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 reference 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  $\mu\text{m}$  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*).