

A STUDY ON BONE MINERALIZATION IN PREMATURE NEONATES

Thesis

Submitted for the partial fulfillment of
the Master Degree of Pediatrics

BY

Mona Mokhles Ali El-Din
M.B., B.Ch.

Under the Supervision of

Prof. Dr. Mohamed Fouad El-Badrwey

Professor of Pediatrics

Faculty of Medicine, Ain Shams University

Dr. Nashwa Ahmed Adel El-Badawi

Assist. Prof. of Clinical Pathology

Faculty of Medicine, Ain Shams University

Dr. Mohamed Nasr El-Din El-Barbary

Lecturer of Pediatrics

Faculty of Medicine, Ain Shams University

Faculty of Medicine - Ain Shams University
(1996)





بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ

طَهُورٌ اللَّهُ الْعَظِيمُ



Acknowledgment

I feel deeply indebted with gratitude to Prof. Dr. MOHAMED FOUAD EL-BADRAWAY, Professor of Pediatrics, Ain-Shams University, who gave me the honour of working under his meticulous supervision. His kind help, considerate guidance, sound advice and valuable remarks were indispensable for accomplishing this work.

I do appreciate the active cooperation and skillful participation of Dr. NASHWA AHMED Adel El-Badawi, Assistant Professor of Clinical Pathology, Ain-Shams University, in the practical part of the work.

No words can describe the effort, enthusiasm and instructive supervision of Dr. MOHAMED NASR EL-DIN EL-BARBARY, Lecturer of Pediatrics, Ain-Shams University, he offered in every step throughout this work.

I am also grateful to the team of Neonatal Intensive Care Units, in Pediatric and Obstetric Departments of Ain-Shams University Hospitals, for their support, fruitful assistance and encouragement throughout whole work.

Mona M. Ali El-Din.

List of Abbreviations

Abbreviation	Full name
1,25(OH) ₂ D	1,25-dihydroxycholecalciferol (1,25-dihydroxy vitamin D)
1- α -hydroxylase	1-alpha hydroxylase
24,25(OH) ₂ D	24,25-dihydroxycholecalciferol (24,25-dihydroxy vitamin D)
α -adrenergic agents	Alpha adrenergic agents
AGA	Appropriate for gestational age
ATPase	Adenosine triphosphatase
β -adrenergic agents	Beta adrenergic agents
BGP	Bone glycoprotein (= osteocalcin)
BMU	Bone multicellular unit
BPD	Bronchopulmonary dysplasia
C-terminal	Carboxyl terminal fragment of PTH (35-84)aa.
Ca / P	Calcium / Phosphorus ratio
cAMP	Cyclic adenosine monophosphate
CBC	Complete blood picture
CNS	Central nervous system
CPAP	Continuous positive airway pressure
CS	Cesarean section
DLC	Differential leukocyte count
DM	Diabetes mellitus
DNA	Deoxyribonucleic acid
DPT	Diphtheria-Pertussis-Tetanus vaccine
ECF	Extracellular fluid
ECW	Extracellular water
EDC	Estimated date of confinement
EDD	Expected date of delivery

List of Abbreviations (Cont.)

ELISA	Enzyme linked immunosorbant assay
FCW	Free cellular water
FFA	Free fatty acid
FIO ₂	Fractionated inspired oxygen
FI	Fluoride
γ-carboxyglutamic acid	Osteocalcin
Gla-protein	Osteocalcin
Hb	Hemoglobin
HBC	Hydroxyapatite binding capacity
HMD	Hyaline membrane disease
i-PTH	Intact parathyroid hormone (1-84)a.a
ICW	Intracellular water
IDM	Infant of diabetic mother
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IP3	Inositol triphosphate
IUGR	Intrauterine growth retardation
IV	Intravenous
K	Potassium
KWO	Kwashiorkor
L / S ratio	Lecithin / sphingomyelin ratio
LBW	Low birth weight
LGA	Large for gestational age
Mg	Magnesium
MgSo4	Magnesium sulphate
mRNA	Messenger RNA
MW	Molecular weight
N-terminal	Amino terminal fragment of PTH (1-34)aa.
NCP	Non collagenous proteins
NICU	Neonatal intensive care unit

List of Abbreviations (Cont.)

OH-Proline	Hydroxyproline
OPV	Oral polio vaccine
PAD	Patent ductus arteriosus
PCo ₂	Partial pressure for carbon dioxide
PEEP	Positive end expiratory pressure
PG	Phosphatidylglycerol
PO ₂	Partial pressure for oxygen
PT	Prothrombin time
PTGs	Parathyroid glands
PTH	Parathyroid hormone
PTT	Partial thromboplastin
RDS	Respiratory distress syndrome
PEM	Protein energy malnutrition
Retic's count	Reticulocytic count
RIP	Respiratory insufficiency of prematurity
RNA	Ribonucleic acid
SGA	Small for gestational age
SLE	Systemic lupus erythematosus
T4	Throxine
TBW	Total body weight
TLC	Total leukocytic count
IRMA	Immunoradiometric assay
VIP	Vasoactive intestinal peptide
VLBW	Very low birth weight
NVD	Normal vaginal delivery
Zn	Zinc

