A STUDY ON RETINOL-BINDING PROTIEN IN THE SERUM OF PREMATURE INFANTS

Thesis
Submitted for partial fulfilment of
Master Degree in Pediatrics

By

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1992

Acknowledgement

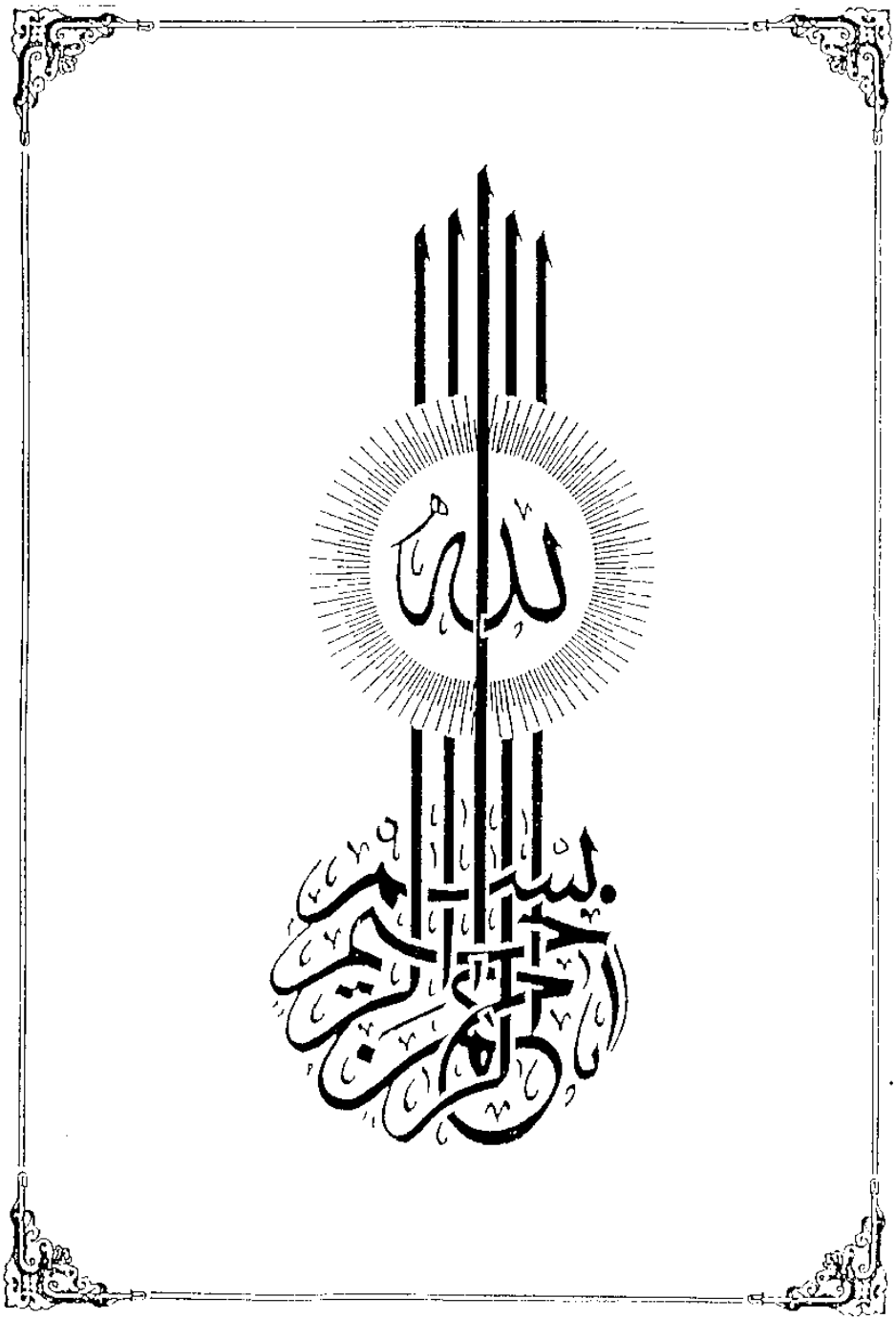
I would like to express my deepest gratitude and respect to Prof. Dr. Mohamed Fouad El Badrawy, for his fatherly care, constructive criticism and continuous encouragment throughout the whole work. It was by his continuous guidance that this work has come to light.

I am deeply indebted to Dr. Alyaa Amal Kotby, for suggesting and planning this work, and for her kind help, continuous encouragement and keen supervision and cooperation.

I am also deeply indebted to Dr. Nashwa Ahmed Adel El-Badawy for her meticulous guidance, keen supervision and co-operation throughout this work.

I am indeed thankful to Dr. Ismail Sadek Ismail, for his valuable suggestions and continuous help.

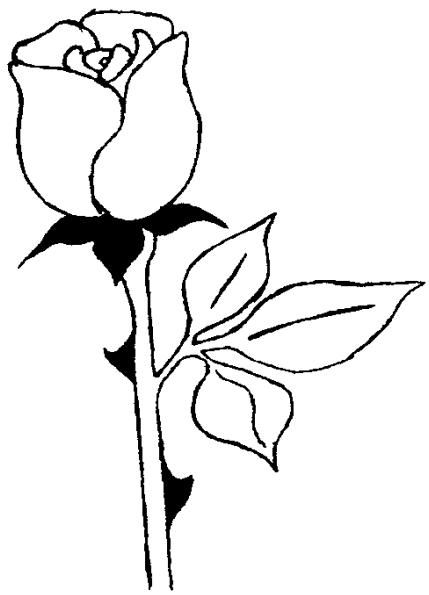
Mwaheb M. H. Awad



To My Father

To My Mother

To My Husband



LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BPD	Broncho Pulmonary Dysplasia
CAT	Catalase
CRABP	Cellular Retinoic Acid Binding Protein
CRBP	Cellular Retinol-Binding Protein
GP	Glutathione Peroxidase
O_2	Oxygen
RBP	Retinol-Binding Protein
RDA	Recommended Dietary Allowance
RDR	Relative Dose Response
RDS	Respiratory Distress Syndrome
SOD	Super-Oxide Dismutase
TPA	Total Parenteral Alimentation
VLBW	Very Low Birth Weight
Zn	Zinc

INTRODUCTION
&
AIM OF THE WORK

INTRODUCTION

Retinol (vitamin A) is a fat soluble vitamin which is essential for epithelial cell function. Retinol stores accumulate in fetal tissue during gestation. Thus the preterm infant faces extrauterine adaptation with less total reserves of retinol than does the term infant. Serum retinol binding protein (RBP) is also lower in premature than full term infants. Nearly about 40% of lung cells are of epithelial origin, thus the premature infant's lung is often the initial site of difficulties during extrauterine adaptation **[Zachmen, 1989].**

The deficiency state of vitamin A, is characterized by loss of cilia and development of squamous metaplasia in the respiratory tract **[Anzano et al., 1980]**. These changes are similar to those found in bronchopulmonary dysplasia (BPD) **[Waible, 1971]**, a chronic lung disease frequently seen in the preterm infant.

AIM OF THE WORK

The aim of the work is to study and to measure the retinol binding protein (RBP) in premature infants in an attempt to assess the needs of the preterm newborn for supplementation with retinol.

REVIEW OF LITERATURE

Retinol (Vitamin A)

Nomenclature:

Vitamin A is a generic term used for all compounds that exhibit qualitatively the biological activity of retinol. The term retinoids has been adapted recently as a general term that includes both the natural forms of vitamin A and synthetic analogus with or without biological activity of retinol **[Goodman, 1984]**.

Vitamin A is a polyisoprenoid compound containing a cyclo-hexenyl ring. It includes retinol, retinoic acid and retinal. Only retinol has full vitamin A activity, the others fulfill some but not all of vitamin A functions **[Mayes, 1990]**.

One international unit of vitamin A is defined as 0.3μ g of all-trans-retinol. For nutritional purposes, a better term is "retinol equivalents" which is used to convert all sources of vitamin A and carotenoids in the diet into a single unit. Thus, 1μg of all-trans-retinol equals 1 retinol equivalent.

Generally, 1μg of retinol is assumed to be biologically equivalent to 6μg of β-carotene or to 12μg of mixed dietary carotenoids **[Moore. 1957]**, (Fig. 1, page 17).

Functions of Vitamin A

The only clearly defined physiological role for retinol is its role in vision. Retinol is oxidized in the rods of the eye to retinal which, when complexed with opsin, forms rhodopsin allowing dim light vision **[Skaln, 1987].**

When rhodopsin is exposed to light, it dissociates as it bleaches and forms all-trans-retinol and opsin. This reaction is accompanied by a change that induces a calcium ion channel in the membrane of the rod cell. The rapid influx of calcium ions triggers a nerve impulse allowing light to be perceived by the brain **[Mayes, 1990].**

Vitamin A is also essential for reproduction growth, maintenance of differentiated epithelia, and mucus secretion. The exact nature of the role of vitamin A in these functions has not been defined at the molecular level, except for its well documented role in vision **[Wald, 1968].**