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**CORRELATION BETWEEN MATERNAL SERUM
AND MATERNAL COLOSTRUM LEVELS OF C4
AND α -1- ANTITRYPSIN IN PRETERM AND
FULLTERM DELIVERING EGYPTIAN LADIES**

Thesis

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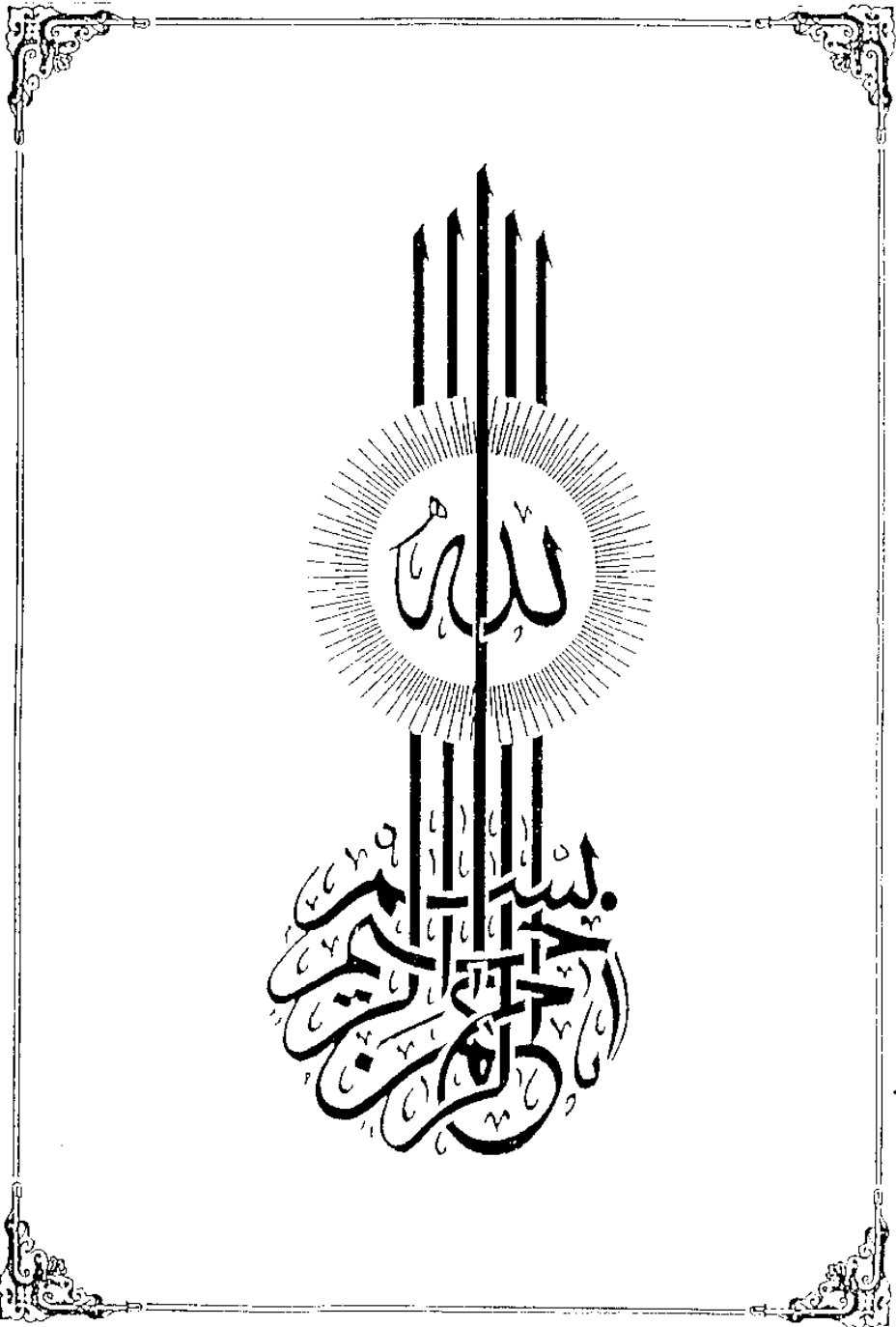
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بسم الله الرحمن الرحيم
"والوالدات يرضعن أولادهن حولين
كاملين لمن أراد أن يتم الرضاعة"

صدق الله العظيم
سورة البقرة الآية ٢٢٣



TO MY HUSBAND

INDEX

	Page No
* Introduction and aim of the work.	1
* Review	3
* Colostrum.	3
* Alpha -1- Antitrypsin.	6
- Physico-chemical properties.	6
- Synthesis of alpha -1- antitrypsin.	7
- Alpha -1- antitrypsin distribution.	7
- Function of alpha -1- antitrypsin.	7
- Significant variation in serum levels of alpha -1- antitrypsin.	8
- Increased level of alpha -1- antitrypsin.	8
- Heredity in alpha -1- antitrypsin deficiency.	9
- Alpha -1- antitrypsin deficiency and disease.	10
.. Alpha -1- antitrypsin and pulmonary diseases.	10
. Familial emphysema.	10
. Atopic allergy.	10
. Bronciolitis.	11
. Brochiactasis.	11
. R. D. syndrome.	11
.. Alpha -1- antitrypsin and liver diseases.	12
. Neonatal hepatitis.	12
. Adult cirrhosis	12
. Hepatic tumours.	13
- Alpha -1- antitrypsin deficiency and Kidney diseases.	13
- Alpha -1- antitrypsin deficiency and gastrointestinal diseases.	13

. Peptic ulcer.	13
. Coeliac disease.	14
. Pancreatitis.	14
* Alpha -1- antitrypsin deficiency and diabetes.	14
* Alpha -1- antitrypsin and Rheumatoid diseases.	14
* Alpha -1- antitrypsin deficiency and other diseases.	15
* Idiopathic haemochromatosis.	15
* Serum alpha -1- antitrypsin in normal pregnancy.	15
* Alpha -1- antitrypsin in colostrum.	15
* The influence of parity, age and maturity of pregnancy on anti-microbial proteins in human milk.	16
* Complement.	17
. Definition.	17
. Historical background.	17
. Nomenclature.	17
. Site of synthesis.	18
. The complement system.	18
. Classical pathway.	18
. Alternative pathway.	19
. Biological consequences of complement activation.	20
. Biological functions of complement.	21
* Hypocomplementaemia.	25
* Diseases associated with hypo-complementaemia.	25
* Hereditary deficiencies of complement.	26
. Hepatic insufficiency	26
. Complement and malnutrition.	26
. Systemic lupus erythematosus.	27
. Complement and diabetes.	27

. Rheumatoid arthritis.	27
. Serum sickness.	27
. Renal diseases.	28
. Hemolytic anaemia.	29
. Gastro - intestinal disorders.	29
. Tumour cell killing.	29
. Infections	30
* Complement levels in pregnancy.	31
* Complement (C4) in colostrum.	31
* Effect of malnutrition on complement level in Colostrum.	32
* The influence of parity, age maturity of pregnancy on antimicrobial proteins in human milk.	33
* Material and methods.	35
* Results.	38
* Discussion.	63
* Summary.	68
* Conclusion.	70
* References.	71
* Arabic summary.	

INTRODUCTION AND AIM OF THE WORK

INTRODUCTION AND AIM OF THE WORK

There is little doubt that breast feeding is a highly desirable and beneficial practice for both mother and infant. It has long been recognized that breast-fed infants experience less morbidity due to gastrointestinal and respiratory diseases. The observation of reduced disease in suckling infants was explained by the reduced ingestion of potentially pathogenic micro-organisms in breast milk as compared to home prepared formula. It is now apparent, however that increased disease resistance in the suckling newborn is due, at least in part to the passive protection conferred by growing list of antimicrobial substances in human colostrum, and milk. Non specific protective factors found in milk include lysozyme, lactoferrin, and complement. Specific factors include immunoglobulins and antibodies for a number of common bacterial and viral pathogens (Miranda. et al., 1983).

Human milk contains also protease inhibitors which lessen inflammatory responses, these include exceptionally high concentration of alpha -1- antichymotrypsin and substantial amounts of Alpha -1- Antitrypsin.

Human colostrum protects the recipient infant not only by providing abroad repertoire of anti-infective agents but also by minimizing inflammation (Goldman. et al., 1986).

The aim of this work is to study the level of complement (C4) and alpha -1- antitrypsin of the human colostrum and serum in two groups of mothers. The first group is that of mothers giving birth to preterm infants. The second group includes mothers giving birth to full term infants, with

the purpose to correlate between maternal colostral and serum levels of complement 4(C4) and Alpha -1- Antitrypsin in each group.

21

REVIEW

19

REVIEW

Colostrum

Colostrum compared with mature milk, is more viscous richer in protein and minerals; and poorer in carbohydrate fat and many vitamins.

The high concentration of total protein and total ash (Minerals) in colostrum gradually decreases as milk flow becomes established. In contrast, the concentrations of fat and lactose, and hence of energy, and of most B vitamins gradually increase during the transition period (Anderson., 1985).

Colostrum also contains more fat soluble vitamins A and E and less water soluble vitamins (McLaren. and Burman., 1976).

In comparison with mature milk, human colostrum is characterized by a lower percentage of saturated fatty acids including medium chain length acids, a higher percentage of monounsaturated and lower level of linoleic and linolenic acids, but a higher percentage of their long chain polyunsaturated derivatives (Gibson. and Kneebone., 1981).

Immunoglobulin is absorbed from the gastro-intestinal tract of the infant only minimally during the first 24-48 hours of life but it is believed to act locally to prevent attachment of pathogenic micro-organisms to intestinal epithelium and to enhance the activity of other anti-microbial factors particularly phagocytes, and where applicable, to neutralize toxins, (Maurice. et al., 1984).

Walker. et al., (1980) has reported that the ingestion of colostrum can facilitate the maturation of mucosal epithelial cells, enhance absorption of digested foods, and perhaps accelerate the development of an intact mucosal barrier. He has found also, that brush border enzymes lactase, sucrase, alkaline phosphatase are enhanced after the ingestion of colostrum.

A benefit believed to be associated with colostrum is its reported ability to facilitate the establishment of bifidus flora in the digestive tract.

The concentrations of BIE globulin (C4) and Alpha -1- antitrypsin were found to be high in colostrum with a decline in concentration as lactation proceeds.

All complement components have been detected in milk and these proteins may provide the same functions that they perform in Serum (Miranda et al,1983).

ALPHA -1- ANTITRYPSIN

Alpha -1- antitrypsin is an acute phase reactant glycoprotein (Morse. et al., 1978). It is the major component of the alpha -1- electrophoretic band of the human plasma proteins and acts as an inhibitor of proteolytic enzymes including:

- Trypsin.
- Chymotrypsin.
- Collagenase.
- Bacterial proteases.
- Leucocyte proteases. (Lancet., 1976), it inhibits serine proteinases and hence is also known as alpha -1- proteinase inhibitor (Carrell. et al., 1982).

Physico Chemical Properties :

Alpha -1- antitrypsin is a single chain glycoprotein, with a molecular weight of 54,000 daltons (Cooper. and Wards., 1979). It consists of a single polypeptide chain with 415 amino acid residues with high content of aspartic acid (9.75%), glutamic acid (12.9%) and leucin (9.9%) (Chain and Rees., 1975).

The carbohydrate content of alpha -1- antitrypsin was estimated by Crawford. (1973) to be (11.5%) including the sugars: Mannose, Galactose, Fructose, N- acetylc glucosamine and sialic acid. It has solubility properties like albumin and is usually sensitive to organic solvents. It is heat and acid labile, its half life is about 6 days (Laurell. et al., 1977).

Synthesis of Alpha -1- Antitrypsin :

Alpha -1- antitrypsin is synthesised mainly in the liver, as early as 29 days of gestation [(Gitlen., (1969), Sharp., (1971), and Jeppson., (1978)]. It is produced in the hepatocytes, extra hepatic sites were also suggested Alpha -1- antitrypsin was demonstrated in the ovarian stroma cells by Bagdasarian. et al., (1981), and it is also known to be synthesized by macrophages (Isaacson. et al., 1979).

Alpha -1- Antitrypsin Distribution :

It is present normally in the serum as well as in a number of body fluids including tears, saliva, lymph, bile, synovium, semen, cervical mucus, amniotic fluid, bronchial secretion, nasal secretion, cerebrospinal fluid, duodenal fluid, colostrum and mother's milk [Talmo., (1975), Morse., (1978), Wolfe., (1981)], also in the peripheral islet cells of normal adult pancreas (Ray and Desmet., (1978)); and in the mucosa of the small intestine and stomach (Ray and Desmet., 1980).

Functions of Alpha -1- Antitrypsin :

It is a primarily defence protein whose function is to protect the tissues against attacks from released proteolytic enzymes in particular the elastic tissues of the lung [Helmburger. et al., (1974) Carrell. et al., (1982)]. It is the major inhibitor of tissue proteases including the pancreatic enzymes trypsin and chemotrypsin, [Kupper's., (1971), Bagdasarian., (1981)].

It is the major inhibitor of two enzymes from Polymorphnuclear granulocytes an elastase and a neutral protease which are able to destroy human pulmonary tissues in vitro, (Bagdasarian., 1981).