Fibronectin Concentration in Human Colostrum and Mature Milk

Thesis
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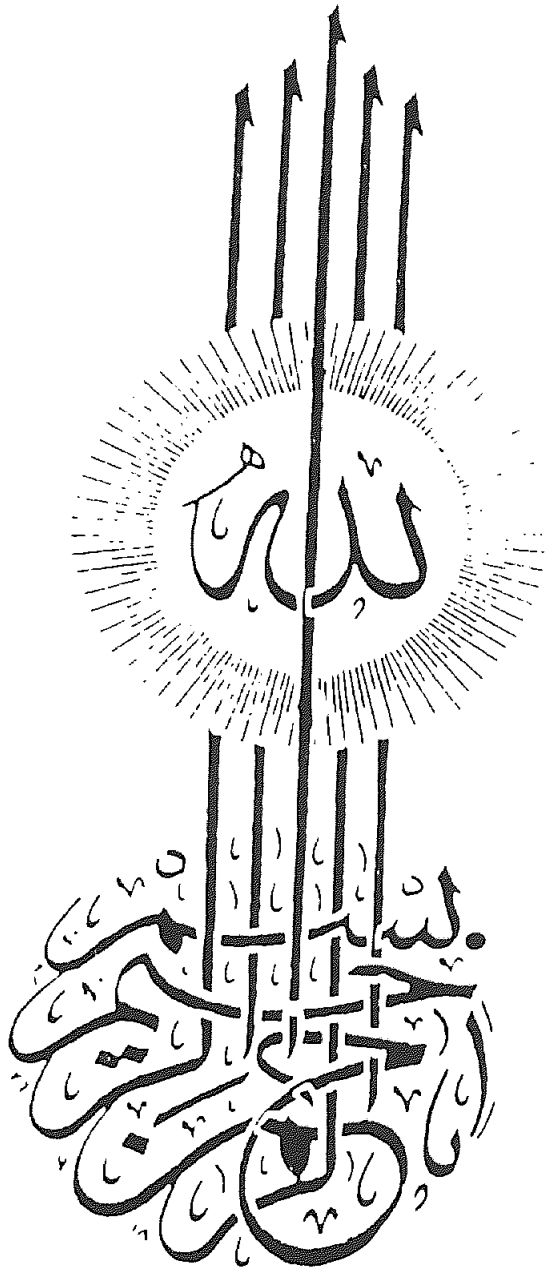
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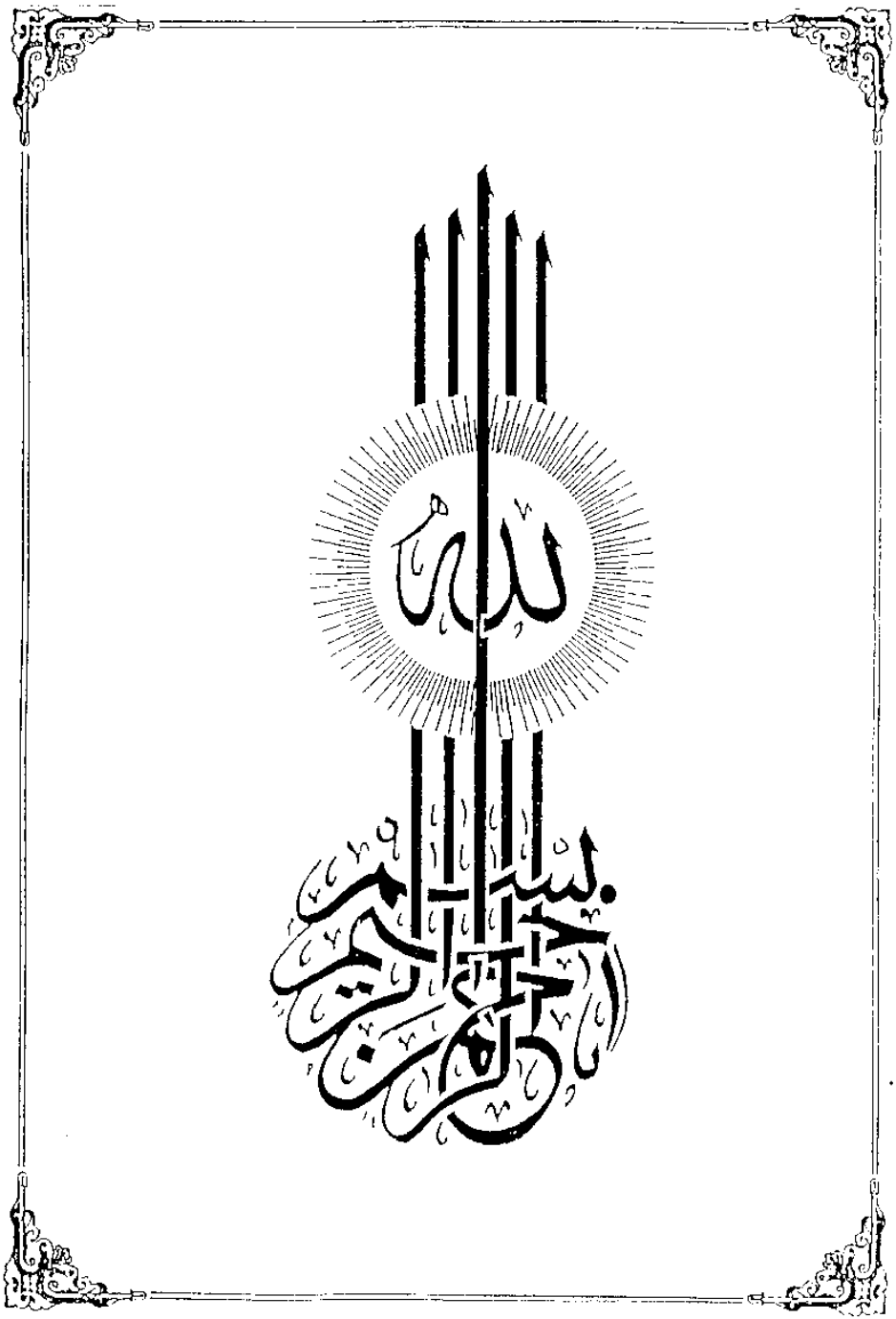

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Abreviations

B.C.G.	Bacillus of Calmette and Guerin
B.M.	Breast Milk
C 3,4	Complement 3,4
D.M.	Diabetes Mellitus
DNA	Deoxy - Ribo Nucleic Acid
EIA	Enzyme Immuno Assay
F XIII	Factor XIII = Fibrin Stabilizing Factor
F.N.	Fibronectin
F.T.	Full term
Ig	Immunoglobulin
P	Probability
P.T.	Pre-term
R.D.S.	Respiratory Distress Syndrome
R.S.V.	Respiratory Syncitial Virus
S.D.	Standard Deviation
Vs	Versus
X	Mean

Introduction& Aim of the Work

Introduction

Breast milk is not only a source of nourishment for the infant but also a strong antimicrobial agent due to the presence of several protective factors which act in synergism to form a good biological system against micro-organisms. ***(Jellife & Jellife 1978).***

The active anti-infective properties of human milk are both humoral and cellular ***(Hanson and Winberg 1982 and Goldman 1986).***

Fibronectin is a high molecular weight glycoprotein found in plasma and on the cell surface. It has a potentialy important role in host defence against infection acting as non specific opsonin. The major sources of plasma fibronectin are hepatocytes, macrophages and endothelial cells. ***(Yoder et al., 1983).***

Fibronectin was found higher in serum of infants which are breast fed compared to serum of formula fed infants ***(Friss et al., 1988).***

Aim of the Work

The aim of this work is to measure levels of fibronectin in breast milk in mothers of premature and full term babies.

Both colostrum and mature milk will be compared, we try to spot light on a further anti-infective substances in the breast milk.

Review of Literature

Fibronectin

Historical Respectives

The term fibronectin (FN) describes a family of structurally and immunologically related high molecular weight glycoproteins that are present in throughout the body ***(Mosesson and Amrani 1980).***

Fibronectin molecules act as bridges between the cell surface and extracellular material ***(Castellani et al., 1986).***

Nomenclature of Fibronectin:

Prior to the suggestion of the name fibronectin the protein had got variety of terms including:

Large external transformation sensitive protein (LETS), soluble fibroblast antigen (S F- antigen), cell-surface protein (C.S.P), cell adhesion factor (C.A.F), galactoprotein (A, Z), cold insoluble globulin (CIG), opsonic protein, and others.

At present, there appears to be wide spread recognition for all forms of the protein as well as general acceptance of the term "fibronectin". The word itseslf was created to emphasize the propensity of the protein to bind to fibrous proteins like collagen & fibrin (fibra

means fiber and nectere means to bind) ***(Mosesson and Amrani 1980).***

Fibronectin has been claimed to be involved in several host defence mechanisms during infection. It is thought to bind at sites of inflammation, attract phagocytic cells and stimulate their phagocytosis. Experimental data point to a possible role of plasma fibronectin as a major opsonin in blood. It is also involved in the coagulation process and is incorporated into the blood clot by cross linking the soluble fibrin after activation by F XIII a ***(Brodin et al., 1985).***

The concentration of plasma fibronectin in normal subjects and in various diseases has been determined in several laboratories. Its levels were greatly increased in patients with primary biliary cirrhosis and were moderatly elevated in the nephrotic syndrome. In patients with severe infection or sepsis, plasma fibronectin did not show a consistent pattern. Patients with disseminated intravascular coagulation, irrespective of its cause had the lowest plasma fibronectin concentration ***(Stathakis et al., 1981).***

Sources and synthesis of Fibronectins:

Fibronectins are produced by a wide variety of cells including: blood fibroblasts, platelets, amniotic cells,

endothelial cells, myoblasts, macrophages, liver epithelial cells and many other cells ***(Akiyama & Yamada, 1983).***

Although many cell types have the capacity to synthesize and secrete fibronectin, several clues suggest that most, if not all, circulating fibronectin is produced by hepatocytes ***(Mosher, 1984).***

Macrophage and endothelial cells share equally in the constitution of plasma pool ***(Birdwell et al., 1978).***

Some studies by ***Owens and Amino (1982)*** also indicated that hepatic synthesis contributes substantially to the plasma FN pool and such synthesis is enhanced by the hormones cortisol & insulin. As well as an increase in plasma FN concentration does occur in the inflammatory situations. ***(Mosher 1986).*** It was proved that hepatocytes in culture secrete FN which co-migrate with plasma FN in electrophoretic systems. Addingly, kupffer cells secrete large amounts of plasma fibronectin ***(Vincent et al., 1989).*** The production of FN has been examined in several types of epithelial cells as cultures of kidney cells, mammary cells, intestinal epithelial cells and in keratinocytes which were proved to produce soluble & cellular associated FN. A noval feature of the FN produced by keratinocytes is the presence of occasional asymmetric pattern suggesting

movement. This might indicate that FN may have a role in keratinocytes attachment, spreading and movement. ***(O'keefe et al., 1984).***

Also FN is present as a part of the temporary matrix for keratinocytes in a healing wound but later on it disappears. FN was detected in the culture of ectodermal cells of chick embryo ***(Critchey et al., 1979).***

Cellular or tissue fibronectin is antigenically related to plasma fibronectin but differences appear to exist in their adhesive properties as well as their solubility ***(Saba, 1986).***

There is an inverse relation between intracellular and extracellular fibronectin. In cultures, endogenous fibronectin is reduced in comparison to surface fibronectin which suggests the presence of a mechanism of autoregulation in the synthesis of fibronectin probably by retroinhibition ***(Ouaissi & Capron, 1985).***

Plasma fibronectin can be incorporated into matrices or tissues, thus it may serve as a reservoir for fibronectin in the tissues where it may influence macrophage clearance of devitalized tissues and local wound repair after injury, as well as vascular and tissue structural integrity ***(Saba, 1986).***