Natural Killer Cell Activity in Protein Calorie Malnutrition

Thesis
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بسم الله الرحمن الرحيم

"سنريهم آياتنا في الآفاق وفي أنفسهم حتى
يتبين لهم أنه الحق ☆ أولم يكف بربك أنه على
كل شيء شهيد" فصلت الآية ٥٣

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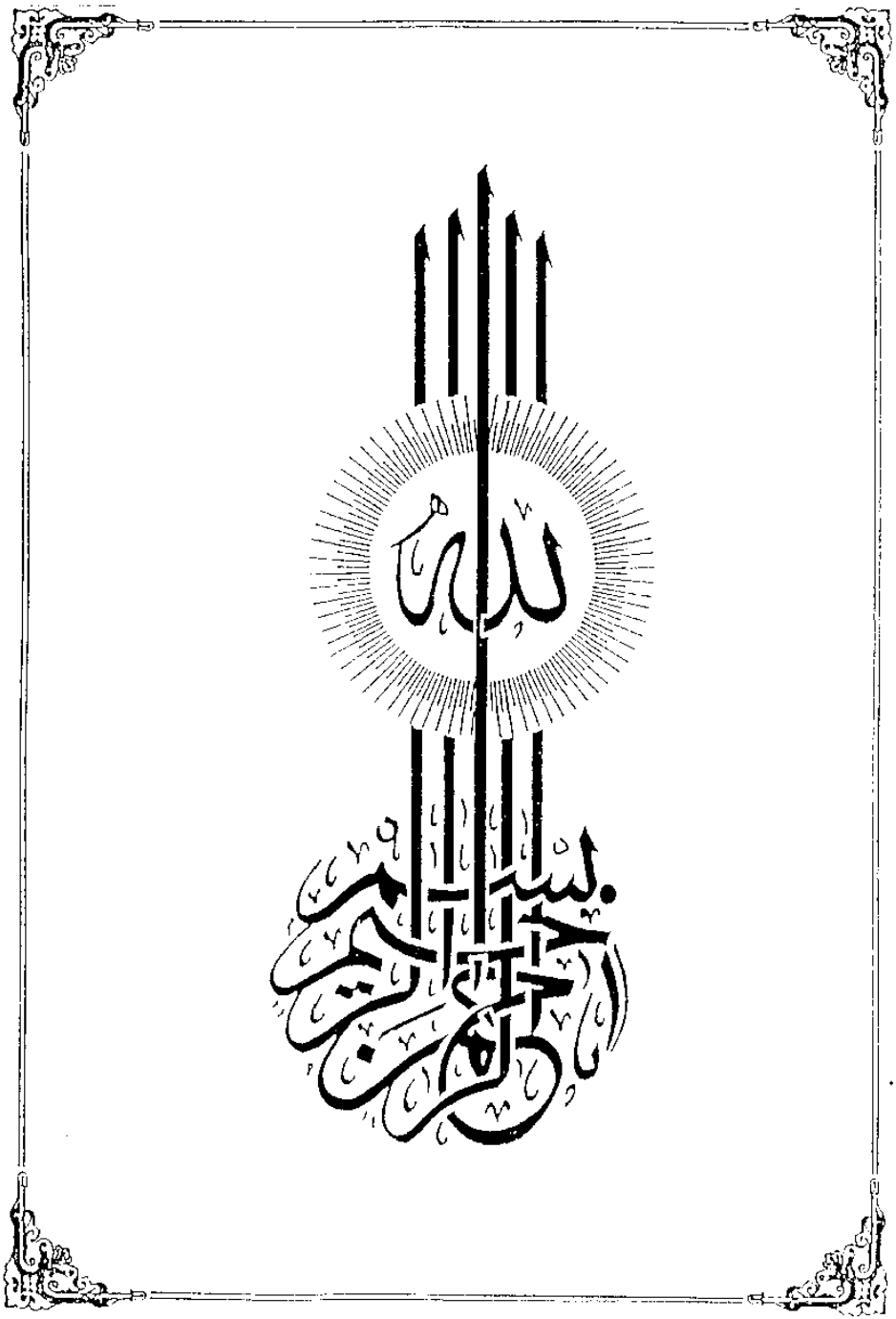

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LIST OF ABBREVIATIONS

ADCC	Antibody dependent cellular cytotoxicity
AIDS	Acquired immune deficiency syndrome
Alb	Albumin
ARC	AIDS related complex
C_3b	Complement3b
C4	Complement 4
C_5	Complement 5
CD	Cluster of differentiation
CD_3	Cluster of differentiation 3
CD_{16}	Cluster of differentiation 16
CD_{56}	Cluster of differentiation 56
CFU-1	Colony forming unit-1
CFU-Es	Colony forming unit of erythrocytes
CFU-GMs	Colony forming unit of granulocytes and macrophages
CMI	Cell mediated immunity
CNS	Central nervous system
CRF	Corticotrophin releasing factor
CTL	Cytotoxic T-lymphocytes
DNA	Deoxyribonucleic acid
EDTA	Ethylenediaminetetracetate
FCM	Flowcytometry
FS	Forward scatter
GM-CSF	Granulocyte-macrophage colony stimulating factor
GVHD	Graft versus host disease
HLA	Human leukocyte antigen
IFN	Interferon
IFN-α	Interferon-α
IFN-β	Interferon-β
IFN-γ	Interferon-γ
Ig	Immunoglobulin
IgA	Immunoglobulin A
IgE	Immunoglobulin E
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IL-1	Interleukin-1
IL-2	Interleukin-2
IL-3	Interleukin-3
K-cell	Killer cell
LAK	Lymphokine activated killer cell

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LFL_2	Log fluorescence 2
LGL	Large granular lymphocyte
LT	Lymphotoxin
LTB_4	Leukotrien-B_4
MHC	Major histocompatibility
MHC I	Major histocompatibility-I
MHC II	Major histocompatibility-II
NAIDS	Nutritionally acquired immune deficiency syndrome
NC	Natural cytotoxic cell
NKCF	Natural killer cytotoxic factor
NKCIF	Natural killer colony inhibiting factor
NKH-1	Natural killer human-1
PBS	Phosphate buffered saline
PBLs	Peripheral blood lymphocytes
PCM	Protein calorie malnutrition
PE_2	Prostaglandin-E_2
PFP	Pore forming protein
PNL	Polymorphonuclear leukocyte
Pre-NK	Pre-natural killer cell
Pro-NK	Pro-natural killer cell
rpm	Run per minute
sIgA	Secretory immunoglobulin-A
sIgG	Secretory immunoglobulin-G
SLE	Systemic lupus erythematosus
TcR	T-cell receptor
TGF-B	Transforming growth factor-B
TLC	Total leukocyte count
TNF	Tumour necrosis factor
VDCC	Viral dependent cellular cytotoxicity
WHO	World Health Organization
X-LPD	X linked-lymphoproliferative disease

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Introduction and Aim of Work

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INTRODUCTION AND AIM OF THE WORK

The natural killer (NK) cell is a lymphoid cell type that is functionally, morphologically and developmentally distinct from T and B lymphocytes (*Spits et al.,* 1995). It can kill virus infected cells, transplanted bone marrow cells and malignant cells without prior sensitization or interaction with other lymphocytes (*Trinchieri,* 1989). NK cells appear to be part of the body's defense mechanisms against cancer as well as infection. Furthermore, they can produce a number of lymphokines that can further augment their action (*Jewett and Bondvida,* 1995).

Protein calorie malnutrition (PCM) is known to be associated with alterations in components of specific and non-specific immunity (*Skerret et al.,* 1990). Ruffman and associates (1987) demonstrated a deficiency of natural immune effector cells, natural killer cells and monocytes/macrophages in protein depleted animal models.

Accordingly, this study is aimed to outline the effect of PCM on NK cell counts in relation to other parameters like serum protein levels and other blood cell counts. Changes will be evaluated in comparison to a group of nephrotic children (as another cause of hypoproteinemia)

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and to a group of healthy children so as to achieve controlled results. The ultimate objective is to reveal new causes for defective microbial or probably tumour cell cytotoxicity in PCM and evaluate the efficacy of the current lines of management in reversing such defects.

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Review of Literature

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PROTEIN CALORIE MALNUTRITION

Protein calorie malnutrition (PCM) is a serious problem in developing countries, where more than half of the deaths of children under five years are related directly or indirectly to malnutrition (*Waterlow,* 1994). Protein calorie malnutrition is prevalent in these countries due to the decline in breast feeding, early introduction of a single food of low energy density and nutritional status, high incidence of infections and infestations and the high incidence of food contamination (*Abiodum,* 1991; *Jelliffe and Jelliffe,* 1992).

Definition

According to the World Health Organization (WHO), protein calorie malnutrition is defined as a range of pathological conditions arising from coincident lack in varying proportions of protein and calories occurring most frequently in infants and children and commonly associated with infection (*WHO,* 1973).

The forms of protein calorie malnutrition may be subclinical or overt, acute, chronic or relapsing, reversible or irreversible, oedematous (hypoproteinaemia) or marasmic (*Waterlow,* 1994).

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