FLOW CYTOMETRIC PHAGOCYTOSIS SCREENING METHOD IN CHILDREN WITH β-THALASSEMIA MAJOR ---

THESIS

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LIST OF ABBREVIATIONS

ADDC Antibody-dependent cytotoxicity
ANOVA Analysis of variance procedures

AO Acridine orange

APC Accessory presenting cell

C Complement Calcium

CF-DA Carboxylfluorescin diacetate
CIC Circulatory immune complexes

CL Chemiluminescence
CR Complement receptor
CSF Colony stimulating factor
DCFH-DA Dichlorofluoroescin diacetate

DNA Deoxyribonucleic acid
EB Ethidium bromide
E. Coli Escherichia coli

ECF-L Eosinophil chemotactic factor-L Ethylene diamine tetra-acetic acid

ESF-A Eosinophil-specific factor-A
Fab Antigen binding fragment
Fc Crystallizable fraction

FCM Flowcytometry

(FCR)² Crystallizable fraction receptor

FITC Fluorescin isothiocyanate

FMLP Formyl methionyl leucyl phenylalanine
G-CSF Granulocyte colony stimulating factor

GM-CFU Granulocyte-macrophage colony forming unit
GM-CSA Granulocyte-macrophage colony stimulating

activity

GM-CSF Granulocyte-macrophage colony stimulating factor

HBA Hemoglobin A
HBF Fetal hemoglobin

HETE Hydroxyeicosatetraeonic acid
HHT Hydroxyhepatotrieonic acid
HLA Human leucocytic antigen
HMP Hexose monophosphate

 H_2O_2 Hydrogen peroxide Ia Immune antigen IFN- γ Interferon- γ

IgAImmunoglobulin AIgEImmunoglobulin EIgGImmunoglobulin GIgMImmunoglobulin M

IL Interleukin

LDCF Lymphocyte-derived chemotactic factor
M-CSF Macrophage colony stimulating factor

Mg⁺⁺ Magnesium

MCH Major histocompatibility complex MIP-1 Macrophage inflammatory protein-1

MPO Myeloperoxidase

NADP Nicotinamide adenine dinucleotide phosphate
NADPH Nicotinamide adenine dinucleotide phosphate

oxidase

NBT Nitroblue tetrazolium
NK Natural killer cells

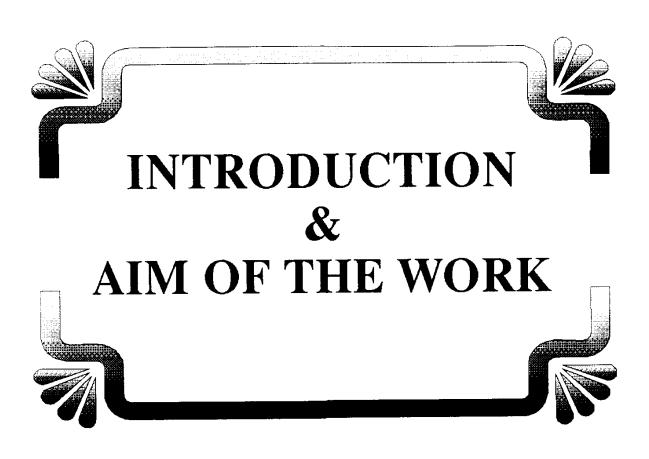
O₂ Oxygen

PI Phagocytic index PG Prostaglandin

PMNs Polymorphonuclear cells
R.E.S. Reticulo-endothelial system
ROI Reactive oxygen intermediate
SAS Statistical analysis system
SHAM Salicyl hydroxamic acid
SOD Superoxide dismutase

TGF-β Transforming growth factor beta

TNF Tumor necrosis factor



INTRODUCTION

Homozygous β-thalasemia is a severe disease, which causes the death of about 100,000 children in the world per annum (*Lehman and Huntsman*, 1974).

The incidence of homozygous β -thalassemia has been found to be 0.285% in children examined in Cairo (*Kamel*, 1960).

Phagocytic killing is the primary mechanism through which the immune system eliminates gram-positive and gram-negative organisms and pathogenic fungi. The phagocytic process is not a simple function. It can be divided into four stages: chemotaxis, attachment, engulfment, and killing and ingestion. It has a critical role in host defence (*Griffin*, 1982).

Deficiencies in phagocytic function, whether primary or secondary can result in life threatening infection with microorganisms that otherwise display relatively low virulence or invasive tendency (Martin and Bhakdi, 1991).

Flowcytometry has been used to measure rates of uptake of particles by populations of phagocytosing cells. Measurement has been made on filter-feeding microroganisms (Lavin et al., 1990).

AIM OF THE WORK:

The aim of this work is to evaluate the phagocytic function in children with β -thalassemia major using a rapid screening flocytometric method.

Another aim of this work is to compare this rapid screening flowcytometric method to the traditional method as tests for phagocytic function.