STUDY OF LIPID PEROXIDATION IN PLASMA AND SYNOVIAL FLUID OF PATIENTS WITH JUVENILE RHEUMATOID ARTHRITIS

THESIS

Submitted for the partial fulfilment of
M.D. DEGREE IN PEDIATRICS

By

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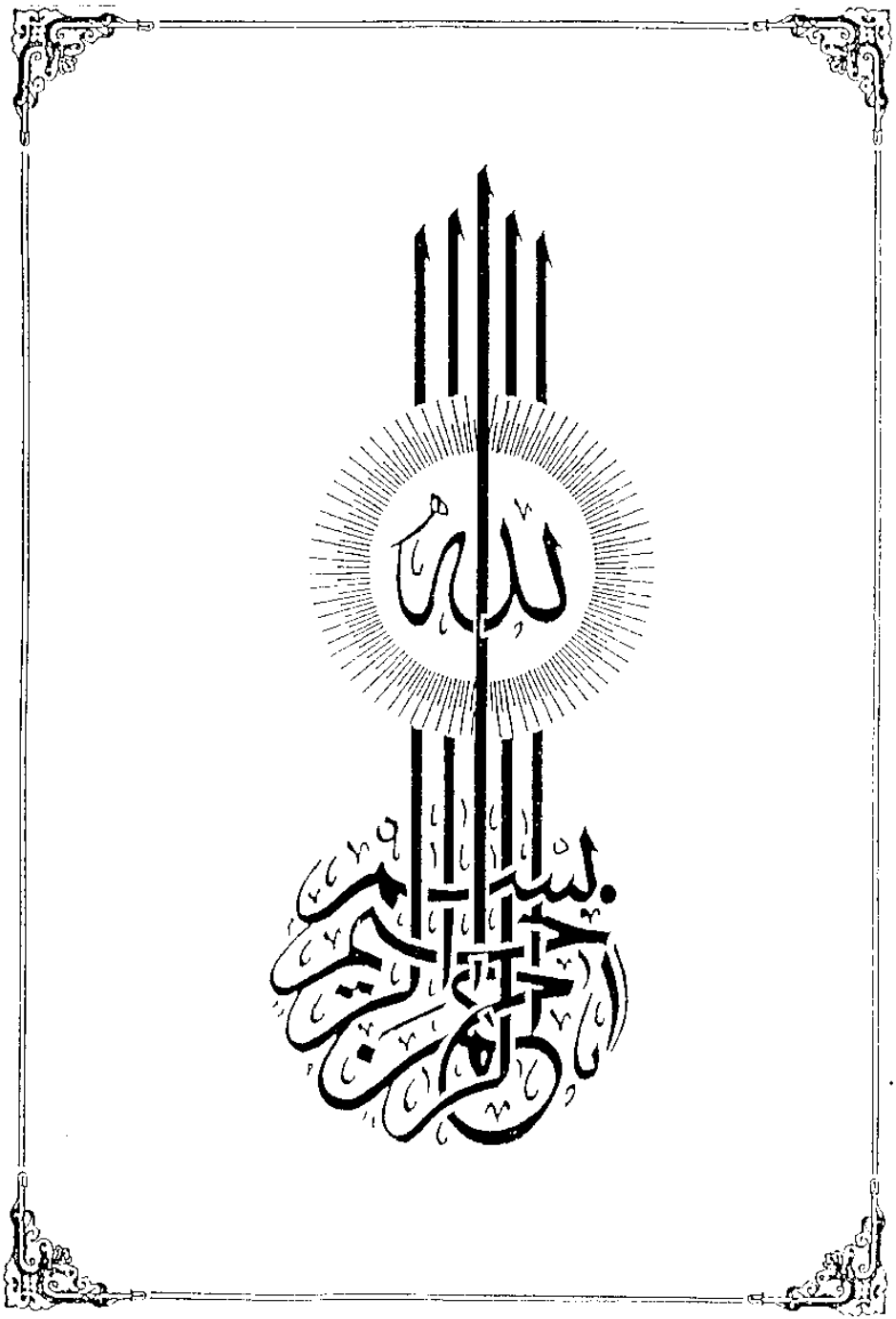
1995

بسم الله الرحمن الرحيم

« قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم .»

صدق الله العظيم

(سورة البقرة ، الآية ٣٢)



ACKNOWLEDGEMENT

I would like to express my utmost gratitude to my eminent ***Professor Dr. Yehia El-Gamal****, Professor of Pediatrics and Head of Pediatric Allergy and Immunology Unit, Ain Shams University, for giving me the privilege of working under his meticulous supervision. His constant support, enthusiastic guidance and encouragement made this work possible to achieve.*

My sincere thanks and appreciation are also due to ***Dr. Sawsan El-Moselhi****, Assistant Professor of Pediatrics, Ain Shams University, for her great help, fruitful advice and continuous encouragement throughout this work.*

I feel truly indebted to ***Dr. Noura El-Kholy****, Assistant Professor of Biochemistry, Faculty of Medicine, Ain Shams University, for her active skillful participation and great cooperation throughout this work.*

I owe my thanks and gratitude to ***Dr. Elham Hossny****, Lecturer of Pediatrics, Ain Shams University, for her great support, patience, enthusiasm and fruitful comments without which this work would have never been accomplished.*

To the team of the Pediatric Allergy and Immunology Unit, to my colleagues, my family, my patients and to everyone who participated in one way or another in this work, I owe my thanks and appreciation.

To...

My Parents.

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ABBREVIATIONS

ADP	Adenosine diphosphate
ANA	Antinuclear antibody
AOA	Anti-oxidant activity
AO	Anti-oxidant
CBC	Complete blood count
CRP	C-reactive protein
CT	Computerized tomography
DFX	Desferrioxamine
DNA	Deoxyribonucleic acid
DMARDs	Disease modifying antirheumatic drugs
EDTA	Ethylene diamine tetracetate
ESR	Erythrocyte sedimentation rate
F	Female
Fe^{2+}	Ferrous ions
Fe^{3+}	Ferric ions
GSH	Glutathione
Hb	Hemoglobin
HDL	High density lipoprotein
HLA	Human leucocyte antigen
HNE	Hydroxy nonenal
H_2O_2	Hydrogen peroxide
Ig	Immunoglobulin
JRA	Juvenile rheumatoid arthritis

LDL	Low density lipoprotein
LP	Lipid peroxidation
LPs	Lipid peroxides
M	Male
MCP	Metacarpophalangeal
MDA	Malondialdehyde
MRI	Magnetic resonance imaging
MTx	Methotrexate
NSAIDs	Non-steroidal anti-inflammatory drugs
$^{\cdot}O^{-}_{2}$	Superoxide radical
OD	Optical density
ODFR	Oxygen derived free radical
$OH^{\cdot}$	Hydroxy radical
PG	Prostaglandin
PIP	Proximal interphalangeal
PUFA	Polyunsaturated fatty acid
RA	Rheumatoid arthritis
RBC	Red blood cell
RES	Reticulo-endothelial system
RF	Rheumatoid factor
$RO^{\cdot}$	Aloxy radical
$ROO^{\cdot}$	Peroxy radical
ROS	Reactive oxygen species
TBA	Thiobarbituric acid
TCA	Tri chloroacetic acid
TLC	Total leucocytic count
UA	Urine analysis
WBC	White blood cell

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INTRODUCTION AND AIM OF WORK

Evidence is accumulating which suggests that oxygen derived free radicals (ODFR) and their products play an important role in the pathogenesis of chronic inflammatory disorders [*Lunec et al.,* 1981]. Granulocytes which accumulate in the rheumatoid joint are known to produce ODFR during phagocytosis of bacteria and immune complexes [*Babior,* 1981]. In the presence of traces of iron salts as a catalyst, these ODFR interact to form the highly reactive hydroxyl radical [*Buettner et al.,* 1978]. Studies in vitro have shown that ODRF can depolymerize hyaluronic acid [*Wong et al.,* 1981], and peroxidise the polyunsaturated fatty acids of cell membranes. This leads to the formation of lipid peroxides, which are commonly measured in tissue homogenates and extracellular fluids by the colorimetric thiobarbituric acid TBA method [*Gutteridge and Halliwell,* 1990]. It has been postulated that some anti-rheumatic drugs may produce their effects by lowering ODFR-mediated lipid peroxidation, e.g. D-penicillamine [*Wade et al.,* 1987]. Iron chelation by desferrioxamine may provide a novel approach to preventing tissue injury in juvenile rheumatoid arthritis JRA [*El-Gamal et al.,* 1990].