

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

THESIS

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بسم الله الرحمن الرحيم

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

صدق الله العظيم

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To...

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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 ₂ O 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
$^{\circ}\text{O}_2$	Superoxide radical
OD	Optical density
ODFR	Oxygen derived free radical
OH°	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°	Aloxy radical
ROO°	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 the Work

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].