



بسم الله الرحمن الرحيم

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Faculty of Pharmacy
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The Impact of High Dose Vitamin C on the Clinical Outcomes of Critically Ill Patients with Acute Respiratory Distress Syndrome

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This work is dedicated to
My sunshine, My son
Youssef

*You have made me stronger, better and more fulfilled
than I could have ever imagined*

My Mom & My Dad
Dr. Hazem Farrag & Dr. Manar Tawfek

*Who have always loved me unconditionally and
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LIST OF CONTENTS

	<i>Page</i>
LIST OF ABBREVIATIONS	II
LIST OF FIGURES.....	V
LIST OF TABLES.....	VII
ABSTRACT	VIII
INTRODUCTION	1
LITERATURE REVIEW	4
1- ARDS	4
2- Oxidative Stress	27
3- Oxidative Stress in ARDS	34
4- Vitamin C	39
5- The role of Clinical Pharmacist in Patient Care.....	49
Literature conclusion.....	51
AIM OF THE STUDY	53
PATIENTS & METHODS	54
RESULTS.....	66
DISCUSSION.....	85
LIMITATIONS.....	90
RECOMMENDATIONS	91
WORK PERSPECTIVE.....	92
SUMMARY	93
REFERENCES	95
ARABIC SUMMARY	-

LIST OF ABBREVIATIONS

Abbreviation	Full term
ARDS	Acute Respiratory Distress Syndrome
AA	Amino Acids
AECC	American-European Consensus Conference
ALI	Acute Lung Injury
ALTA	Albuterol for the Treatment of Acute Lung Injury
AP-1	Activator protein 1
APACHE	Acute Physiology and Chronic Health Evaluation
ARE	Antioxidant Response Element
ARE	Antioxidant response element
AST	Aspartate aminotransferase
ALT	Alanine transaminase
BAL	Bronchoalveolar Lavage
BALF	Bronchoalveolar Lavage Fluid
BALTI-2	Beta-Agonist Lung injury Trial-2
BH4	Tetrahydrobiopterin
BMI	Body Mass Index
BUN	Blood Urea Nitrogen
bZIP	Basic region/leucine zipper
CBC	Complete Blood Count
CMV	Cytomegalovirus
CNC	Cap'n'collar
CNS	Central Nervous System
CO₂	Carbon dioxide
COPD	Chronic Obstructive Pulmonary Disease
CT	Computerized Tomography
CVP	Central Venous Pressure
DAD	Diffuse Alveolar Damage
DHA	Dehydroascorbic acid
DNA	Deoxyribonucleic acid
eNOS	Endothelial Nitric Oxide Synthase
FiO₂	Fraction of inspired oxygen

Abbreviation	Full term
GLUT	Glucose transporters
GM-CSF	Granulocyte-macrophage colony-stimulating factor
GPx	Glutathione Peroxidase
GRa	Glucocorticoid receptor alpha
GSH	Reduced Glutathione
H₂O₂	Hydrogen Peroxide
HDIVC	High dose IV Vitamin C
HNE	4 Hydroxy nonenal
HRP	Horseradish peroxidase
ICU	Intensive Care Unit
IgA	Immunoglobulin A
IL-1	Interleukin 1
IL-6	Interleukin 6
IL-8	Interleukin 8
iNO	Inhaled nitric oxide
INR	International Normalized Ratio
iNOS	Inducible Nitric Oxide Synthase
IV	Intravenous
K	Potassium
Keap1	Kelch-like ECH-associated protein 1
kPa	Kilopascal
LC-MS-MS	Liquid Chromatography with tandem mass spectrometry
LDIVC	Low dose IV Vitamin C
LDL	Low-Density Lipoprotein
LMWT	Low Molecular Weight
LPO	Lipid Peroxidation
MDA	Malondialdehyde
MDI	Metered Dose Inhaler
MPO	Myeloperoxidase
MV	Mechanical Ventilation
Na	Sodium
NAC	N-acetylcysteine

Abbreviation	Full term
NADPH	Nicotinamide Adenine Dinucleotide Phosphate
NETs	Neutrophil Extracellular Traps
NF-kB	Nuclear factor-Kappa B
NGT	Nasogastric tube
NHLBI	National Heart, Lung, and Blood Institute
NMBAs	Neuromuscular blocking agents
NNT	Number needed to treat
NO	Nitric Oxide
NRf2	Nuclear factor erythroid 2- related factor
OH	Hydroxyl Radical
OTC	Over the Counter
PaO₂	Partial oxygen pressure
PCWP	Pulmonary capillary wedge pressure
PEEP	Positive end-expiratory pressure
PF	PaO ₂ /FiO ₂
PGE1	Prostaglandin E1
PH	Potential of Hydrogen
PO	Per Oral
Pplat	Plateau Pressure
RAs	Retinoic acids
RCT	Randomized Controlled Trial
ROS	Reactive Oxygen Species
Scr	Serum Creatinine
SOD	Superoxide Dismutase
SP-1	Specificity protein 1
SVCTs	Sodium Ascorbate cotransporters
TBARS	Thiobarbituric acid reactive species
TIIP	Type II Pneumocytes
TMP	Tetramethylbenzidine
TNF α	Tumor Necrosis Factor Alpha
VTE	Venous Thromboembolism

LIST OF FIGURES

Figure no.	Title	Page
1.1.	Healthy Lungs and Exudative Phase of ARDS	11
1.2.	The Proliferative & fibrotic stages of ARDS	12
1.3.	Radiograph of chest for ARDS	13
1.4.	Histology early exudative phase.....	15
1.5.	Histology showing type II pneumocytes	15
1.6.	Histology showing late proliferative phase	16
1.7.	Histology showing late fibrotic phase	16
1.8.	The history of ALI/ARDS	18
1.9.	The role of Nrf2 in the pathogenesis of pulmonary diseases...	37
1.10.	Ascorbic acid synthesis	41
1.11.	Ascorbic acid metabolism	44
2.1.	Human Nrf2 standard curve	63
2.2.	Human IL8 standard curve	63
2.3.	Human Vitamin C standard curve	64
3.1.	Patients' flow chart.....	67
3.2.	Vitamin C levels in test and control after treatment	71
3.3.	Nrf2 levels in test and control after treatment	72
3.4.	IL8 levels in test and control after treatment.....	73
3.5.	Percentage change in Vitamin C after treatment.....	74

Figure no.	Title	Page
3.6.	Percentage change in IL8 after treatment.....	75
3.7.	Percentage change in Nrf2 after treatment	76
3.8.	PaO ₂ /FiO ₂ , values in test and control groups after treatment	78
3.9.	Percentage change in PaO ₂ /FiO ₂ treatment	79
3.10.	Kaplan-Meier curves for comparison of time effects.....	84