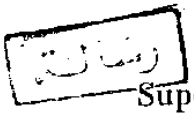
EMERGING THERAPEUTIC TECHNIQUES APPLIED TO TRANSFUSION MEDICINE

Essay

Submitted For Partial Fulfillment of The Master Degree in
Clinical and Chemical Pathology

Presented By

Azza Hassan Ali



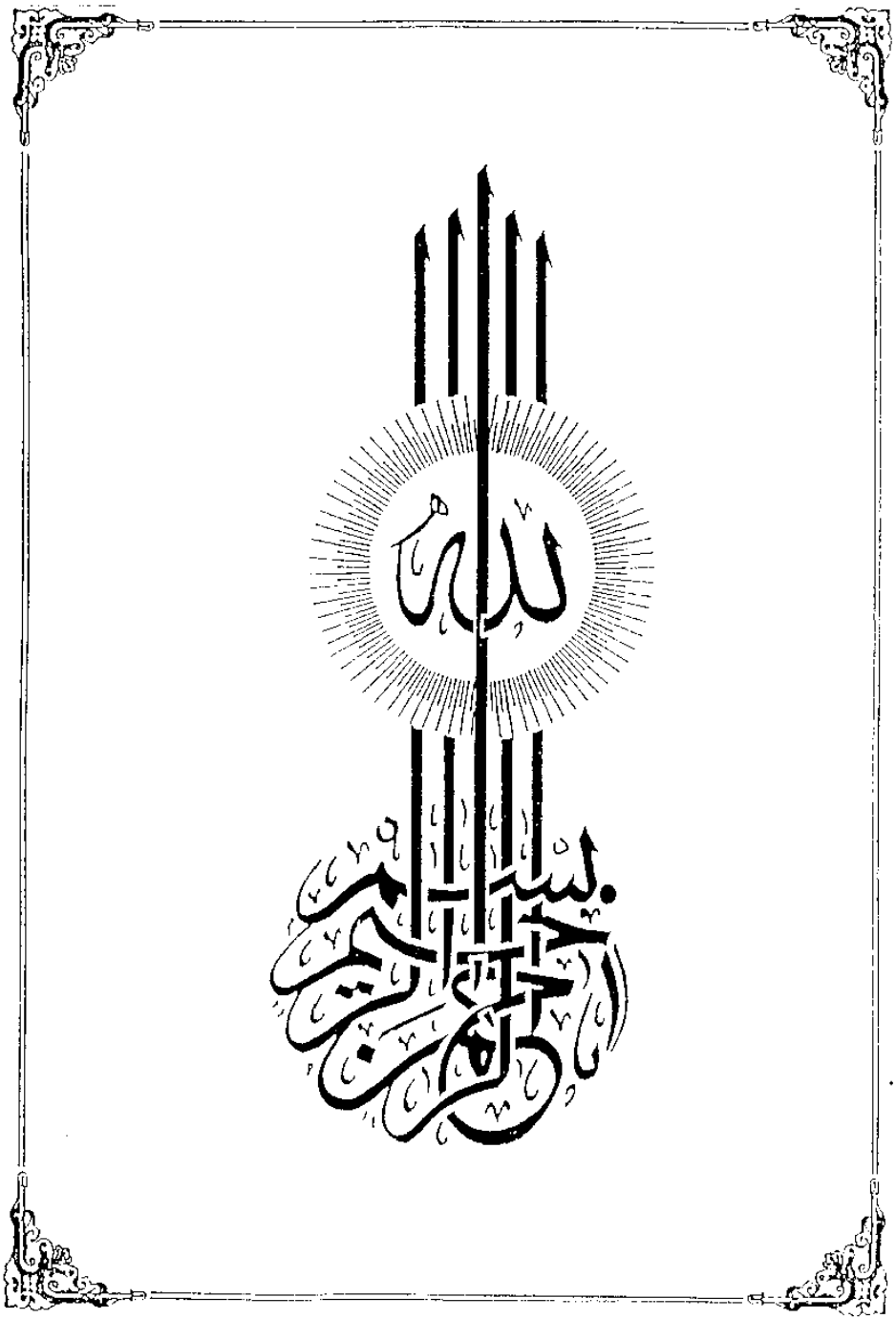
Supervised By

Prof. Salwa Mohamed Youssef
Prof. of Clinical Pathology,
Faculty of Medicine, Ain Shams University

Dr. Salwa Saad Mostafa
Ass. Prof. of Clinical Pathology,
Faculty of Medicine, Ain Shams University

Dr. Azza El Sayed Hashem
Lecturer of Clinical Pathology,
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
1998



ACKNOWLEDGEMENT

I would like to express my deepest gratitude and most sincere thanks to ***Prof. Salwa Youssef***, Professor of Clinical Pathology, Faculty of Medicine, Ain Shams University, for her intensive support, continuous guidance and for having offered me much of her valuable time.

My cordial appreciation is extended to ***Dr. Salwa Saad***, Assistent Professor of Clinical Pathology, Faculty of Medicine, Ain Shams University, for her generous help, and precious assistance in the supervision of this work.

I feel gretly indebted to ***Dr. Azza Hashem***, Lecturer of Clinical Pathology, Faculty of Medicine, Ain Shams University, for her helpful suggestions, endless effort, wise guidance, valuable remarks, and sincere advice. Her help has been a cornerstone in this work.

LIST OF ABBREVIATION

AHF : Anti Hemophilic Factor.
ALPc : Aluminum phthalocyanine.
AMT : Aminomethyl trimethyl psoralen.
ATP : Adinosine triphosphate.
BPD : Benzoporphyrin derivative.
CMV : Cytomegalo virus.
DHE : Dihematoporphyrin Ether.
2, 3 DPG : Diphosphoglycerate.
FDA : Food Drug Administration.
FIO_2 : Fractional concentration of oxygen in inspired gas.
GV : Gilvocarcin V.
HBsAg : Hepatitis B surface antigen.
HCV : Hepatitis C virus.
HD : Hemodilution
HDL : High density lipoprotein.
HES : Hydroxy ethyl starch.
HIV : Human immunodeficiency virus.
IBS : Intraoperative blood salvage.
LDL : Low density lipoprotein.
LEH : Liposome encapsulated hemoglobin.
MC : Merocyanin.
8MOP : 8 Methoxypsoralen.
NFPLP : Nor 2 formylpyridoxal phosphate.
PABD : Preoperative autologous blood donation.
PEG : Polyethyleneglycol.
PFOB : Perfluorooctyl bromide.
PLP : Pyridoxal 5 phosphate.

PO_2	: Oxygen tension.
RBC	: Red blood cell.
SV	: Sindbis virus.
TMP	: Trimethylproralen.
TNBP	: Tri (n-butyl) phosphate.
UV	: Ultraviolet.
VSV	: Vesicular stomatitis virus.
WBC	: Whit blood cell.

TABLE OF CONTENTS

INTRODUCTION AND AIM OF THE WORK

INTRODUCTION AND AIM OF THE WORK

Advances in multiple fields of research have fostered the emerging diagnostic and therapeutic technologies applied to transfusion. Refinements in immunoassays, cell knetics, flowcytometry, and molecular biology such as polymerase chain reaction methodology, provide more senstive and accurate diagnosis. Derivative therapeutic strategies include apheresis altermatives to homologous transfusion and viral inactivation techniques.

Apheresis was used first with therapeutic interest, but later become more important for collecting blood components for transfusion. current atoumated apheresis instruments use microprocessor technology to administer an anticoagulant, collect the treated blood, separate components either by centrifugation or by filteration, isolate the desired component and recombine the remaining components for return to the patient and donor *(Hodgson and Mercan, 1991).*

Although the safety of blood transfusion has been markedly imporoved by the use of tests to screen donors for an array of infectious illness, a risk free blood supply is an unrealistic goal *(Gould and Moss, 1991).*

Most recent research with red cell substitutes has focused on chemically modified hemogloin, which has the additional advantages of high oxygen - carrying capacity, colloid osmotic activity and low viscosity technical factors such as impurity,

instability and batch-to-batch inconsistency have delayed the introduction of red cell substitute products into clinical use. Unresolved scientific questions such as the physiological consequences of variation in oxygen affinity and the toxicity of products await the production of model solutions of high purity *(Moss et al., 1991).*

Viral inactivation has been and is currently used in a broad sense to encompass procedures that employ physical and chemical agents designed to damage viruses selectively, as well as processes that separate virus from blood products *(Wagner et al., 1991).*

Aim of Work :

The aim of this essay is the review the emerging techniques applied to transfusion medicine. Therapeutic apheresis, autologous blood transfusion, red cell substitutes and viral inactivation techniques are mainly concerned.

CHAPTER I

AUTOLOGOUS BLOOD TRANSFUSION