IMMUNOLOGICAL MARKERS OF HEPATITIS IN SOME HEMODIALYSIS UNITS IN CAIRO

Thesis

Submitted in the Partial Fulfilment of

Master Degree of Clinical and Chemical

Pathology

By

Hany Mamdouh Sorour

M.B., B.Ch.

SUPERVISED BY

Prof. Dr. Aida Abdel-Azim

Professor of Clinical Pathology

Prof. Dr. Wahid El Saied

Professor of Medicine

Dr. Amani Saleh

Lecturer of Clinical Pathology

FACULTY OF MEDICINE

AIN SHAMS UNIVERSITY

1984

IMMUNOLOGICAL MARKERS OF HEPATITIS IN SOME HEMODIALYSIS UNITS IN CAIRO

Thesis

Submitted in the Partial Fulfilment of

Master Degree of Clinical and Chemical

Pathology

By

Hany Mamdouh Sorour

M.B., B.Ch.

SUPERVISED BY

Prof. Dr. Aida Abdel-Azim

Professor of Clinical Pathology

Prof. Dr. Wahid El Saied

Professor of Medicine

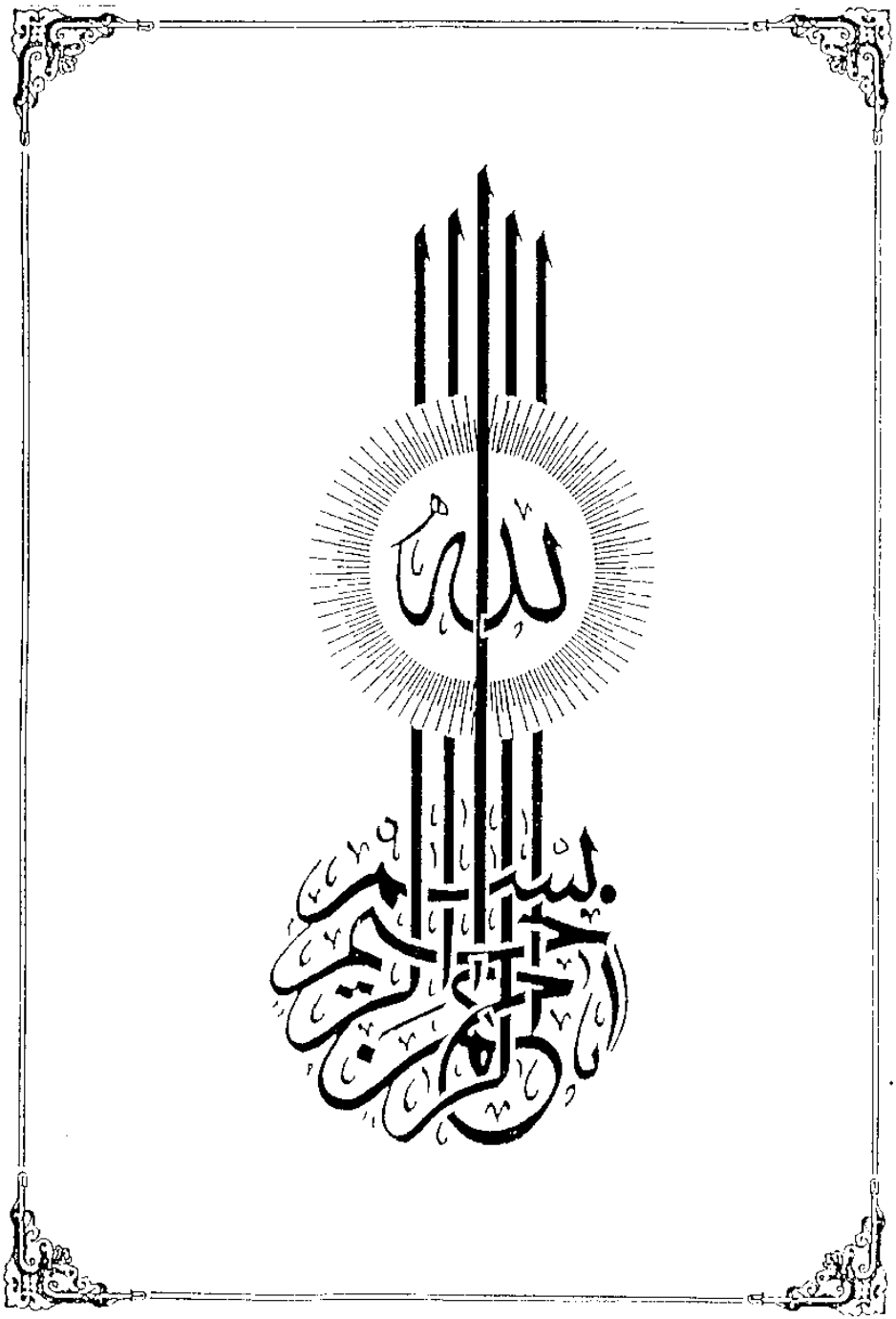
Dr. Amani Saleh

Lecturer of Clinical Pathology

FACULTY OF MEDICINE

AIN SHAMS UNIVERSITY

1984



ACKNOWLEDGMENT

I wish to express my deepest gratitude and sincere thanks to Professor Dr. ***Aida Abdel Azim,*** *Professor of Clinical Pathology, Faculty of Medicine, Ain Shams University for her great advice and kind encouragement with a real maternal spirit.*

I would also like to thank Professor Dr. ***Wahid El Saied,*** *Professor of Medicine, Faculty of Medicine, Ain Shams University for his help.*

I also owe Dr. ***Mostafa Kamel Abdel Rahman,*** *General Director of Technical Affairs, Ain Shams University Hospitals for his continuous encouragement and support.*

My supreme gratitude and undebtedness also goes for Dr. ***Amany Saleh,*** *Lecturer of Clinical Pathology, Ain Shams University for her constant help and faithful guidance.*

Wording is not enough to thank Dr. ***Laila El Shawarby,*** *Lecturer of Clinical Pathology, Ain Shams University, for her precious advices and kind patience in supervising the review.*

Also, I would like to thank Dr. ***Mona Rafiek,*** *Lecturer of Clinical Pathology, Ain Shams University for her support and great help.*

I would like to send my appreciation and gratitude to Dr. ***Adel Afiffi,*** *Lecturer of Medicine, Ain Shams University, and his colleagues in the hemodialysis Unit in Ain Shams University Hospitals, who gave me the facilities to collect the samples from the patients.*

I would like also, to thank Abbott Laboratories, Diagnostic Division, which gave me the apparatus, Quantum II, as a gift to facilitate my work and help me to cope with the recent researches.

I thank my ***Wife*** *for her assistance and help.*

I also thank my ***Colleagues*** *and all those who assisted me in the study.*

CONTENTS

ABBREVIATIONS

HBsAg	Hepatitis B Surface Antigen
Anti HBs	Antibody to Hepatitis B Surface Antigen
HBeAg	Hepatitis Be Antigen
Anti HBe	Antibody to Hepatitis Be Antigen
Anti HBc IgG	IgG Antibody to Hepatitis B core Antigen
Anti HAV IgG	IgG Antibody to Hepatitis A virus
EIA	Enzyme Immunoassay
RIA	Radio Immunoassay
NANB	None A None B Hepatitis

Introduction
&
AIM OF WORK

INTRODUCTION AND AIM OF THE WORK

Introduction:

Hepatitis is a well recognized entity in hemodialysis units. Previous investigations showed that over 80% of dialysis units had reported the disease in either patients or staff personnel or both. (Garibaldi, 1973). Epidemiologic and laboratory evidence has most often implicatedthe hepatitis B virus as the etiologic agent in dialysis-associated hepatitis. Nearly all reported out breaks in dialysis units have occurred over a long period, have been associated with a high rate of positivity to the hepatitis B surface antigen (HBsAg) or antibody (anti HBs), and have been characterized by a clinical illness that is often mild in patients but severe in staff members. (Jones **et al.**, 1967 - Marmion **et al.**, 1972).

Since viral hepatitis is now recognised to be a major risk both to staff and patients during hemodialysis, it seems to be very important to evaluate

the serological markers of hepatitis to differentiate between its variable types. Many programs were discussed to prevent the occurrence of hepatitis in hemodialysis units, and they prove to be, more or less, efficient in this respect.

II- Aim of the Work:

The aim of this work is to detect the different serological markers in both hemodialysis patients and staff, from which we can find the percentage of infectivity among patients and staff.

From the above item we may have general guidelines for preventing and controlling hemodialysis associated hepatitis outbreaks.

Review of Literature

HAEMODIALYSIS

If the kidney function is impaired by a chronic kidney disease and uraemic syndrome develops, the patient can only be kept alive by a regular treatment with artificial kidney.

These treatments must be continued for the rest of the patient's life, and this is referred to as chronic intermittent, or periodic haemodialysis.

The objective of chronic intermittent haemodialysis is to replace the kidney function in patients with terminal kidney insufficiency in such a way that the patient recovers his sense of well-being and physical fitness.

History of Haemodialysis:

Dialysis was tried out as early as 1913 on dogs, albeit with little success. In 1940 Professor Brinkman in Groningen carried out experiments with blood dialysis in which he used cellophane as a dialysing membrane. On the bases of these experiments,

Dr Kolf 1943 designed an artificial kidney for human use, and in 1943 - 1945 he dialysed some patients with varying degrees of success, he carried out further experiments which have finally led to the use of this artificial kidney on a larger scale since 1965.

Hemodialysis is a method of treating the blood outside the body in which water and waste products resulting from metabolism are removed from the blood, the blood is taken out of an artery and after purification led back into a vein. Heparin is added to the blood system to avoid its coagulation when it comes out of the body.

Dialysis Procedure:

The dialysis technique differs in details according to the views held in dialysis centers. American dialysis, for example, differs fairly strongly from dialysis in Europe.

Generally speaking dialysis is performed for shorter period in the U.S.A. (5-6 hours) so that the breakdown products are not removed so effectively.

[illegible]

Different dialysis units are also opposed with regard to sterility. In one center, the patients are allowed to smoke during dialysis, while in another this is strictly forbidden.

In the dialysis center, the patients are weighed undressed because attempts are made to keep their weights constant, and blood pressure is taken. The artificial kidney and the instruments necessary for the treatment are prepared in advance, sterilised and laid out ready for making the connection. Two nurses connect the patient aseptically to the machine and adjust the parameters. The patient is given food and drinks, they read and watch television or sleep. A doctor discusses the situation and their complaints, and may give a hand in the connection step if needed. The patients know each other as they form a group which is dialysed at the same time.

VIRAL HEPATITIS AND HEMODIALYSIS UNITS

Viral hepatitis is a disease of major significance in the world today, not only in terms of overall morbidity and mortality resulting from acute and chronic forms of illness, but also because it places enormous demands on economic and medical resources (Tolsma & Bryan 1976).

Type A Hepatitis:

The hepatitis A virus is a single stranded RNA, small, and spherical particles ranging from 27-30 nm. It is a relatively heat resistant i.e. withstands 60°C for 30 minutes. It does not grow in tissue culture by ordinary methods: some limited multiplication of laboratory adapted strains has been demonstrated in primate cells with no cytopathic effect. It is pathogenic for chimpanzees and other primates e.g marmosets. (Timbury, 1983).

Viral hepatitis type A is a world-wide in distribution : endemic in most countries, more common in rural than urban commities. Epidemics appear from time to time, some of which are associated with sewage