REVIEW STUDY
OF
HUMAN LEPTOSPIROSIS

ESSAY

Submitted in Partial Fulfilment
For the Master Degree (M.Sc.)
In

CLINICAL AND CHEMICAL PATHOLOGY

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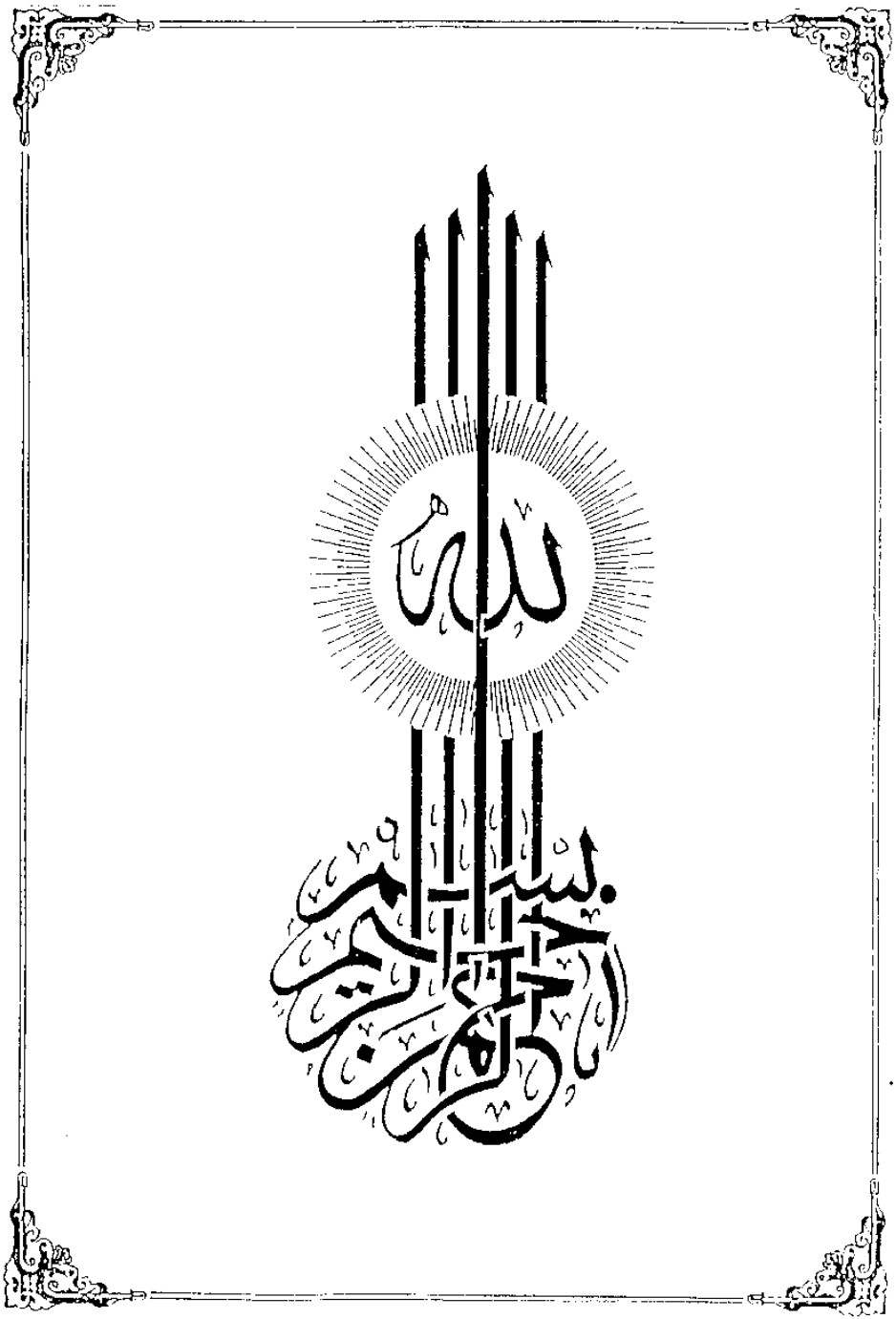
1995

بسم الله الرحمن الرحيم



To my family.....

with my deepest gratitude

ACKNOWLEDGEMENT

I would like to present my sincerest appreciation for, and my deepest gratitude to ***Ass. Prof. Dr. Hadia Hussein Bassim, Assistant Professor of Clinical Pathology,*** *Ain Shams University, for her abounding patience, and prolific assistance. To her, I am greatly indebted for the choice of the subject of the essay and I am further honoured by her supervising it.*

I would also like to thank, from the depth of my heart, ***Dr. Nevine Nabil Kassem, Lecturer of Clinical Pathology****, Ain Shams University, for her kind help and continuous guidance throughout this work.*

My full thanks go to ***Dr. Fatma Elsayed Metwaly, Lecturer of Clinical Pathology,*** *Ain Shams University, for her great support and for her observations that have contributed a lot to the preparation of this work.*

In a broader context it is a pleasure and privilege to acknowledge the support and encouragement of my parents.

Einas Abd Elhafeez

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List of Abbreviations

ARDS: Acute respiratory distress syndrome.
ARF: Acute respiratory failure.

Brenda : Bacterial restriction endonuclease DNA analysis.
BSA : Bovine serum albumin.

CFT: Complement fixation test.
CIE: Counter immunoelectrophoresis.
CK: creatine kinase.
CMI: Cell mediated immunity.
CSF: Cerebrospinal fluid.

ECG: Electrocardiogram.
EDTA: Ethylene diamine tetra acetate.
ELISA: Enzyme linked immunosorbent assay.

Hb.: Haemoglobin.

Ig.: Immunoglobulin.
IHA: Indirect haemagglutination.

JHR: Jarisch-herxheimer reaction.

KDa: Kilodalton.

L.: Leptospira.
LAL: Limulus amoebocyte lysate test.
LPS: Lipopolysaccharide.

M.Abs: Monoclonal antibodies.
MAT: Microscopic agglutination test.
MCAT: Microcapsule agglutination test.

NM: Nano-meter.

OE: Outer envelope.
OMP: Outer membrane protein.

PBMC: Peripheral blood mononuclear cells.
PF: Periplasmic flagella.
Ph: Negative logarithm of hydrogen ion concentration of a solution.
PHA: Phytohaemagglutinin.
PWM: Pokeweek mitogen.

REA: Restriction endonuclease analysis.
r RNA: Ribosomal ribonucleic acid.

TBS: Triethanolamine buffered saline.
TNF: Tumour necrosis factor.

INTRODUCTION

AND

AIM OF THE WORK

INTRODUCTION

Leptospira is a genus composed of long, slender, helical, motile bacteria ***(Ding and Yelton, 1993)***. Some leptospires are free-living saprophytes, commonly found in fresh water and occasionally in brackish and even salt water ***(Coghlan, 1989)***. The pathogenic leptospires consist of seven species: leptospira interrogans (sensustricto), L. santarosai, L. borgpetersenii, L. noguchi, L. weilii, L. inadai and L. kirschneri ***(Baril et al., 1992)***. Leptospires (leptospira interrogans) infecting humans are primarily maintained by warm-blooded vertebrates ***(Torten, 1979)***. In cities, the Norway rat (Rattus norvegicus), (***Thiermann, 1977)*** and dog ***(Thiermann, 1980)*** have been regarded as major reservoirs. The degree of human-animal contact with wild and domestic animals may be an important determinant of infection ***(Childs et al., 1992)***.

Leptospirosis is a wide spread zoonosis caused by members of the genus leptospira. These highly invasive spirochetal pathogens are capable of infecting a broad range of mammalian hosts through either direct contact with an infected animal, or indirect contact with soil or water contaminated with urine from a chronically infected animal ***(Haake et al., 1993)***.

Leptospirosis of worldwide distribution, is an acute febrile illness, the severity of which varies from mild to rapidly fatal disease. Pathogenic leptospira species, are responsible for a wide spectrum of

clinical symptoms, and the disease is often misdiagnosed ***(Heath et al., 1965)***, particularly in tropical countries ***(Perolat and Reeve, 1992)***.

The initial septicaemic phase of the infection is characterized by fever and malaise. The second or immune phase occurs about two weeks later and is associated with rise in circulating IgM-leptospira antibodies and recurrence of fever, encephalitis, neuritis, thrombocytopenia, heart block and cardiac failure may manifest at this time ***(Rugman et al. 1991)***.

Leptospirosis is a term applied to disease caused by all leptospiras regardless of specific serotype. Correlation of clinical syndromes with infection by different serotypes leads to the conclusion that a single serotype of leptospira may be responsible for a variety of clinical features; conversely a single syndrome, e.g. aseptic meningitis may be caused by multiple serotypes. Hence there is a preference for the general term leptospirosis rather than the syndromes such as Weil's disease and Canicola fever ***(Sanford, 1992).***

AIM OF THE WORK

The aim of the work is to throw light on: pathogenicity, laboratory diagnosis and clinical aspects of human leptospirosis.

REVIEW

OF

LITERATURE

HISTORICAL

ASPECT

HISTORICAL ASPECT

Noguchi first recovered this organism from a rat in ***1917***, in 1922 the first case of Weil disease was identified in a person associated with rat exposure. For many years, the rat was considered the only animal host of leptospira icterohemorrhagiae ***(Wadsworth et al., 1922).***

Meyer and his associates (1939), popularized the concept that canicola infection in the United States caused disease in dogs and humans.

Randall and his associates (1944), isolated this organism from a naturally infected dog, and the organism had subsequently been associated with many animal hosts, including goats, swine, cattle and hamsters.

Recognition of many new serotypes of leptospires followed the establishment in the early 1950's of serologic diagnostic services for leptospires by the centers for disease control and the Walter Reed Army Institute of Research. Along with the identification of additional leptospiral serotypes, the clinical disease spectrum associated with infection by leptospires was elucidated. Patients with autumnal fever (a disease in japanese peasants and potters) and Fort Bragg fever (a febrile illness associated with pretibial eruptions described in army recruits), were shown to suffer from leptospirosis caused by autumnalis ***(Schaeffer, 1951).***