STUDY OF CAMPYLOBACTER JEJUNI IN DIABETES MELLITUS

(THESIS)

Submitted for partial fullfilment for master degree

(Internal Medicine)

By

ALAA FAHMI ALI SARG

(M.B,B.CH)

Supervisors

rof . Dr.
IOATASSEM SALAH AMER
·of. of Internal Medicine
in Shams , Faculty of Medicine

Prof . Dr.
IBRAHIM KHALIL ALI
Prof. of Clinical Pathology
Ain Shams , Faculty of Medicine

Dr. MOHSEN MOSTAFA MAHER
Ass. Prof. of Internal Medicine
Ain Shams , Faculty of Medicine

Faculty of Medicine
Ain Shams University

1994

STUDY OF CAMPYLOBACTER IN DIABETES MELLITU.

(THESIS)

Submitted for partial fullfilment for master degree

(Internal Medicine)

By

ALAA FAHMI ALI SARG

(M.B,B.CH)

Supervisors

'rof . Dr.

10ATASSEM SALAH AMER

'rof. of Internal Medicine

.in Shams , Faculty of Medicine

Prof . Dr.

IBRAHIM KHALIL ALI

Prof. of Clinical Pathology

Ain Shams , Faculty of Medicine

Dr. MOHSEN MOSTAFA MAHER

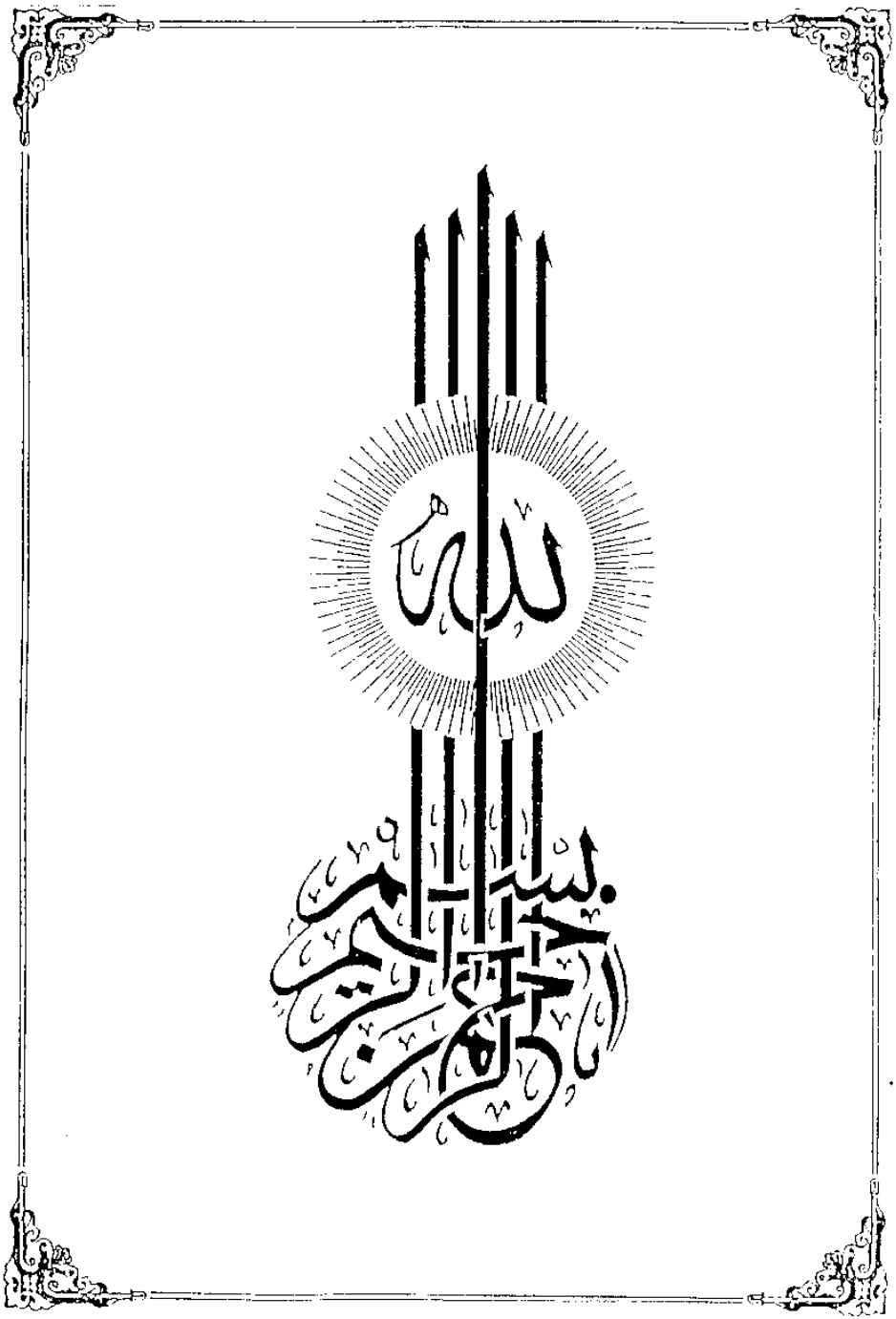
Ass. Prof. of Internal Medicine

Ain Shams , Faculty of Medicine

Faculty of Medicine

Ain Shams University

1994



Dedication

To

My Parents

ACKNOWLEDGMENT

I would like to express my utmost gratitude to *Prof. Dr. Moatassem Salah Amer* , proffessor of Internal Medicine, Aim Shams, Faculty of Medicine , for his continuous encourgment, sincere advise, meticulous supervision and valuable help throughout the preparation of the work .

I would like to express my deepest and sincere gratitude to *Prof .Dr. Ibrahim khalil Ali,* proffessor of Clinical Pathology, Ain Shams, Faculty of Medicine, who offered me much of his valuable time, experience and kind advise throughout the work .

I am greatly indepted to *Dr. Mohsen Mostafa Maher,* Ass. Proffessor of Internal Medicine, Ain Shams, Faculty of Medicine for his keen supervision , generous cooperation, and great help throughout the work .

Contents

INTRODUCTION AND AIM OF THE WORK

Introduction and Aim of the Work

Diabetic patients have disturbances of the immune system, affecting , humoral , cell mediated immunity and neutrophil functions, so , diabetics are liable to localized as well as systemic infections *(Amolak et al ; 1993)* .

The role of bacterial overgrowth in the pathogenesis of diarrhea in diabetics is controversial . The following sequence has been proposed, because of a motility disorder , there is gastric and small intestinal stasis , as a result , bacterial overgrowth occurs in the stomach and small intestine *(Christnsen; 1992).*

Campylobacter jejuni are spiral , motile, microaerophilic gram negative rods, that may cause, gastroenteritis, toxic megacolon , appendicitis and cholecystitis. Moreover campylobacter may cause bacteraemia in patients who have one or more of pre-existent major medical conditions, including diabetes mellitus, tuberculosis, steroids or other immunosuppressive therapy. So in this respect, this organism can be considered an opportunestic pathogen *(Chung and Lee; 1970)* .

Aim of the work :

This work will be concerned with the study of the prevalence of campylobacter jejuni in the colon of diabetics compared with normal subjects.

REVIEW

DIABETES MELLITUS

Diabetes mellitus is the most common endocrine disease . the true frequency is difficult to ascertain because of differing standards of diagnosis but probably is between 1 and 2 percent If fasting hyperglycemia is the criterion for diagnosis .

The disease is characterized by metaboilc abnormalties and by long-term complications involving the eyes, kidneys , nerves and blood vesseles *(Foster ; 1994).*

Diagnosis :

The diagnosis of symptomatic diabetes is not difficult, when a patient presents with signs and symptoms attributable to an osmotic diuresis and is found to have hyperglycemia .

The Problem arises with the asymptomatic patient who for one reason or another is considered to be a potential diabetic but has a normal fasting glucose concentration in the plasma. Such patients are often given oral glucose tolerance test, and , if abnormal values are found , they are diagnosed as having impaired glucose tolerance or diabetes .

There seems to be litte question that normal glucose tolerance is strong evidence against the presence of diabetes; the predictive value of a positive test is less certain *(Foster ; 1994)* .

Much evidence suggests that the standard oral glucose tolerance test overdiagnoses diabetes to a remerakable degree , probably because of a variety of stresses can produce an abnormal response . The operative mechansim is thought to be epinepherin discharge. Epinepherin blocks insulin secretion , stimulates glucagon release , activates glycogen breakdown and impairs insulin action in target tissues such that hepatic glucose production is increased and the capacity to dispose of an exogenous glucose load is impaired . Even anxiety over venipunctures may generate sufficient epinepherine to produce an abnormal test. Concomitant illnes, inadequate diet, and lack of physical exercise also , contribute to false - positive examinations .

Criteria for the diagnosis :

Data Group of the National Instiutes of Health in 1979 provided revised criteria for the diagnosis of diabetes following a challenge with oral glucose .

1- Fasting (overnight) : venous plasma glucose concentration $\geq$ 140 mg / dL on at least two seperate occasions.

2- Following ingesion of 75g of glucose: Venous plasma glucose concentration ≥ 200 g/ dL at 2-h and on at least one other occasion during the 2-h test i.e two values ≥ 200 mg/dL

must be obtained for diagnosis.

If the 2-h value is between 140 and 200 mg/dl and one other value during the 2-h test peroid is equal to or greater than 200 mg/dL, diagnosis of "impaired glucosa tolirance" is suggested.

The interpretation would be that persons in this category are at increased risk for development of fasting hyperglycmia or symptomatic diabetes.

Classification

Primary :

1- Insulin- dependent diabetes mellitus (IDDM, Type I).

2- Non insulin- dependent diabets mellitus (NIDDM, Type II).

a- Non obese.

b- Obese.

c- Maturity- onset diabetes of the young (MODY).

Secondary :

1- Pancreatic diseases.

2- Hormonal abnormalities.

3- Drug or chemical induced.

4- Insulin receptor abnormalities.

5- Genetic syndromes.

6- Other.

Primary implies that no associated disease is present, while in the secondary category some other identifiable condition causes or allows a diabetic syndrome to develop.

Insulin dependence in this classification is not equivalent to insulin therapy. Rather, the term means that the patient is at risk for ketoacidosis in the absence of insuln. Many patients classified as non insuln- dependent require insulin for control of hyperglycemia, although they do not become ketoacidotic if insulin is withdrown *(Foster ; 1994).*

The term type I is often used as synonym for insulin- dependent diabetes and type II diabetes has been considered equivalent to non insulin- dependent disease. This probabaly is not ideal, since some patients with apparent non- insulin- dependent diabetes may in fact destined to become fully insulin dependent and prone to ketoacidosis. The subset of patients in this category are non obese subjects who usully express HLA antigens associated with susceptibility to insulin dependent diabetes and have evidence of an immune response to islets cell antigens.

For this reason, it has been suggested that the classification be modified such that the terms insulin- dependent and non insulin dependent describe physiologic states (Ketoacidosis- prone and ketoacidasis- resistant respectively), while the terms, type I and type II

refer to pathogenetic mechansims (immune- mediated and non immune-mediated, respectively).

Using such classification, three major forms of primary diabetes would be recognized.

1- Type I insulin-dependent diabetes.
2- Type I non insulin-dependent diabetes.
3- Type II non insulin-dependent diabetes.

Category 2 is an intermediate stage of autoimmune destruction in which sufficient insulin remains to prevent ketoacidasis but not to maintain normal blood glucose.

The NIDDM stage of type I diabetes likely to occurs when the autoimmune process begins at an older age and progress at slower rate. It is infrequently seen when IDDM appears in childhood or early adolescence *(Foster ; 1994).*

GASTROINTESTINAL MANIFESTATIONS OF DIABETES MELLITUS

Diabetes mellitus affects every organ system; the gastrointestinal tract is no exception *(Katz and Spiro ; 1966)* .

The prevalence of gastroenterologic symptoms in diabetics is unknown but probably is considerable *(Feldman and Schiller ; 1983).*

Diabetic Autonomic Neuropathy In Gastrointestinal Tract

Most patients have long standing diabetes with symptoms of autonomic neruopathy, such as postural hypotension , impotence or sweat glands instability, many have evidence of somatic peripheral neuropathy as well as eye and renal complications of diabetes *(Feldman and Schiller ; 1983)* .

Direct evidence of autonomic neuropathy involving the gastrointestinal tract in humans comes from functional studies and a limited number of morphologic investigations . Sham feeding was infflectuall in eliciting an acid secretory response in diabetics, while the response to intragastric stimuli was maintained *(Feldman et al ; 1979).* Similary, the normal spike response to a meal was absent in the colon of langstanding diabetics with constipation *(Battle et al ; 1980).*

The subjects responded normally to pentagastrin and benthanecol, respectively, showing that the problem was not one of end-organ damage and implying that a defect in the efferent arm of the autonomic