EFFECTS OF DIET ON THE BLOOD-GLUCOSE AND INSULIN LEVELS IN NON-INSULIN DEPENDENT DIABETICS

THESIS

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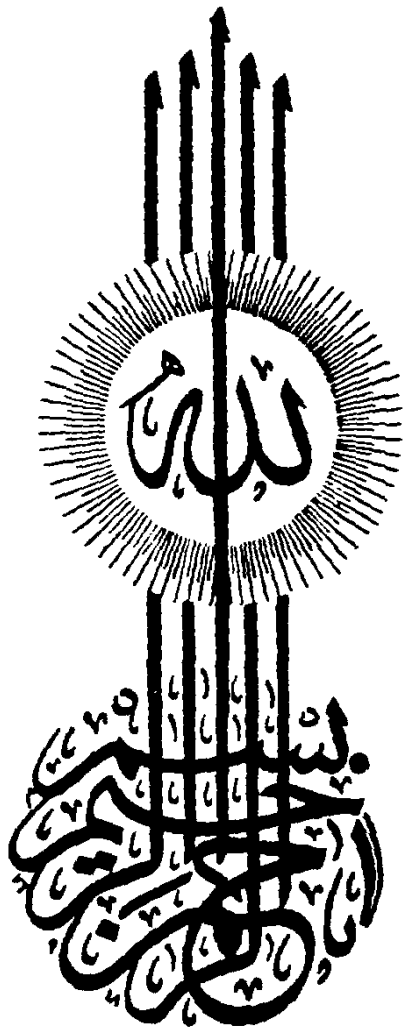

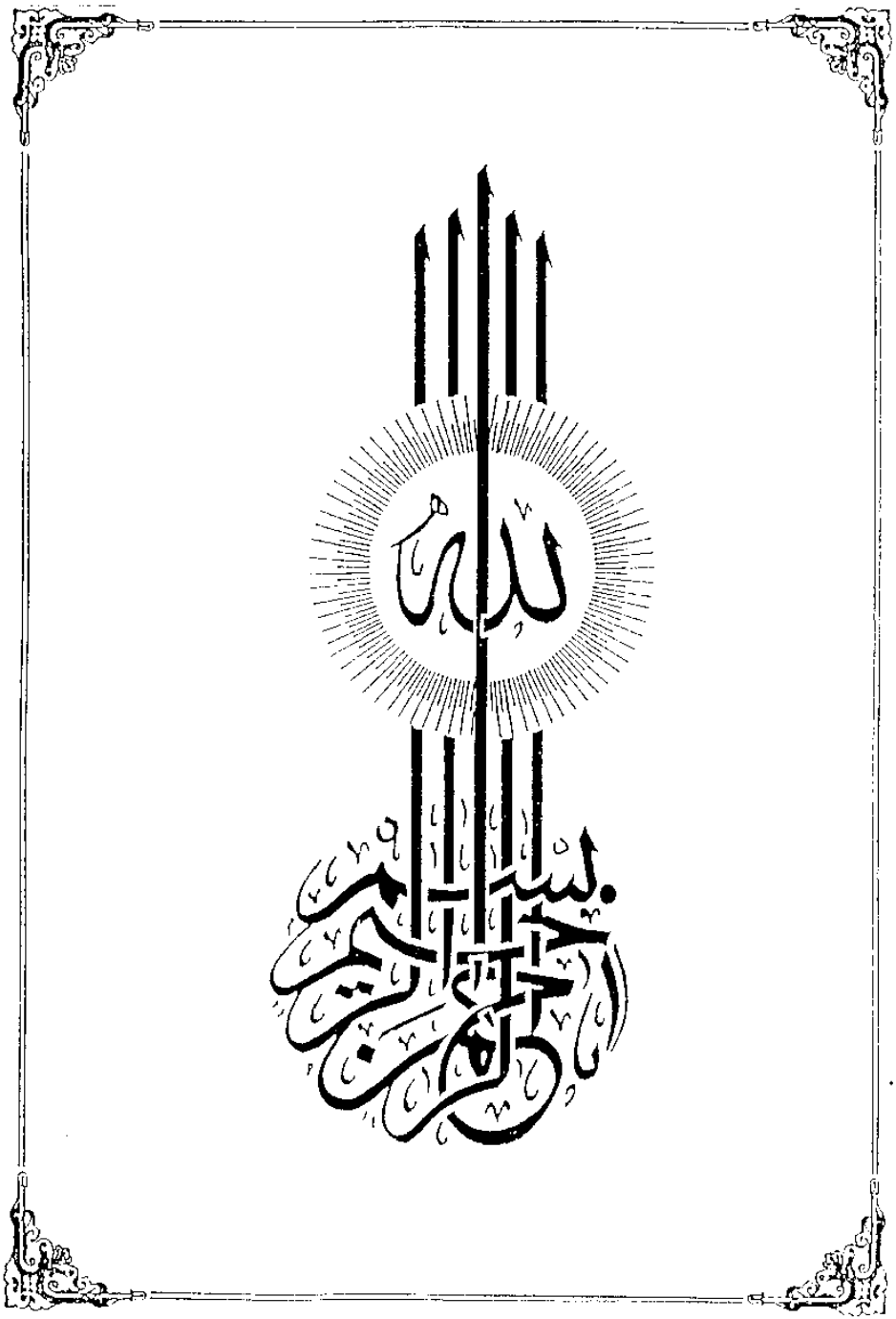

INTRODUCTION

AIM OF THE WORK

C O N T E N T S

A C K N O W L E D G E M E N T

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INTRODUCTION AND AIM OF THE WORK

Diabetes mellitus has been classified as " Insulin - Dependent " and " Non-Insulin-Dependent " by (National Diabetes Data Group, 1979). Treating diabetes by manipulation of the diet is the oldest form of therapy, being practiced by the Egyptians in 3500 BC. (Christakis & Miridjanian, 1970). Through subsequent years and centuries, a number of dietary recommendations have been made for treating diabetes; many of these have been based on faulty or incomplete knowledge of the pathophysiology.

The patients who are treated with diet alone may be able to utilize their capacity to secrete endogenous insulin more effecientently if food intake is divided into three meals a day rather than a single large meal. The obese individual with non-insulin-dependent diabetes can decreases plasma glucose levels by weight reduction (Doar,J.W.H. et al 1975); This is probable due to reversal of insulin - resistance produced by the effect of obesity on insulin receptors (Olefsky , 1976 ; Bar et al, 1976).

AIM OF THE WORK :

Is to evaluate the effects of egg (as a test meal) on the serum glucose and insulin levels in patients with Type II (Non - Insulin - Dependent) Diabetes Mellitus .

MATERIAL AND METHOD :

Twenty patients of Type II Diabetes Mellitus (ten lean and ten obese), plus ten normal lean subjects as control, will be the material of this work. Serum glucose and insulin levels will be estimated for each of them, both on fasting and at 30, 60, and 120 minutes follwing the consumption of 200 grams of egg.

Collected data will be processed statistically and discussed in light of common literature.

REVIEW OF LITERATURE

HISTORICAL REVIEW

The first actual description of the disease dates back some I500 years BC. About 400 BC., Charak and susrut in India noted the sweetness of the urine of the diabetics. The correlation between obesity and diabetes, the tendency of the disease to passes from one generation to another through the " seed ", and even classification of the disease into two types, one associated with emaciation, dehydration, polyuria, and lassitude ; and the other characterized by " stout build, gluttony, obesity, and sleepiness". Aretaeus (2 AD) used the general term "Diabetes " (= siphon) "Mellitus" (= honey or sweet). The disease correlation with the gangrene was noticed by the Arab Avicenna (I AD).

Dodson (I775) demonstrated that the sweetness of urine was due to sugar and suggested that it was not formed de novo by the kidney, but rather that the kidney removed it from the body, a fact scientifically confirmed by the great French physiologist , Claude Bernard in the mid-I800'S.

In I889 Von Mering and Minkowski (two German scientists) first produced experimental diabetes by removing the dog's pancreas. Later scientists discovered that even if the pancreas had been destroyed, the animal does not becomes diabetic if the islets of Langerhans were preserved. Banting and Best in Ontario, Canada began an important and historical research project, when they obtained the minced and purified islet tissues from animals and reinjected the material into an animal with diabetes mellitus, they

found that the mean blood sugar fell ; this was an important event for the many thousands of diabetics throughout the world and signaled a whole new era in the treatment of diabetes.

In I936 the use of long-acting insulin was introduced in the management of the insulin-requiring diabetics.

During the World War II, Germans observed that certain sulfonamide derivatives lowered blood glucose ; a discovery not used in practice untill I955, when- oral sulfonylureas began to be generally used in therapy of milder maturity-onset diabetes mellitus (Mable, et al I97I).

DEFINITIONS OF DIABETS MELLITUS

Seth (1981) was defined it as a clinical syndrome, characterised by chronic hyperglycemia and glucosuria, and it is caused by heterogenous group of disorders which have in common either a deficiency or diminished effectiveness of endogenous insulin resulting in a disturbance of carbohydrates, proteins, and lipid's metabolism.

Malcolm and Santiago (1984) defined diabetes mellitus as a disease syndrome best characterized as a state of chronic hyperglycemia, may present with acute symptoms that include thirst, polyuria, and unexplained weight loss (classical onset) and these can present as a progressive life threatening ketoacidosis or hyperosmolar coma; subacute symptoms including the above, together with pruritis valvae, balanitis, other skin infections, unusual fatigue or visual impairement; chronic hyperglycemia may be asymptomatic, but it is generally recognised as a predisposing risk factor for specific microvascular complications, namely retinopathy and nephropathy. The clinical suspicion of diabetes is strongly enhanced by finding glucosuria with or without ketonuria, but biochemical confirmation of the diagnosis is required by accurate measurement of blood glucose level using a specific glucose assay.

National Diabetes Data Group (1979) and World Health Organization (1980) put criteria for the definition and diagnosis of

diabetes mellitus on clinico-biochemical recommendations :

I. Single blood glucose measurement, with acute symptoms, gross and unequivocal elevation of blood glucose confirms the diagnosis, namely fasting venous plasma glucose levels of 7.8 mmol/L.or more (I40 mg/I00 ml or more), or post-absorptive venous plasma glucose levels of II.I mmol/L. or more (200 mg per I00 ml or more).

2. Two blood glucose measurements ; in absence of symptoms of diabetes mellitus, at least two abnormal values, fasting and post-absorptive as defined above are required to esatblish the diagnosis.

CLASSIFICATION OF DIABETES MELLITUS

In the last few years different classifications of diabetes mellitus have been reported, each taking into consideration some points of interrest from the auther's point of view :

Oakley (1978), classified it, from the clinical point of view, into five types :

I. CLINICAL (OVERT) DIABETES MELLITUS :

A patient with diagnosed diabetes and its clinical manifestations (signs and symptoms) and even those of complications .

2. SUBCLINICAL (CHEMICAL or ASYMPTOMATIC) DIABETES MELLITUS :

Abnormal oral glucose tolerance test, without symptoms or complications.

3. LATENT (SUSPECTED) DIABETES MELLITUS :

A normal person with no symptoms or complications, but with an abnormal carbohydrate tolerance only under stress conditions , like physical stress, obesity, pregnancy, or on steroid therapy.

4. GESTATIONAL DIABETES MELLITUS :

A woman who becomes diabetic during pregnancy, but ceases to be so after delivery.

5. POTENTIAL DIABETES MELLITUS :

The subject who has normal carbohydrate tolerance, but at high risk of becoming diabetic due to e.g., strong family or obestetric history, in particular a history of having large babies or of unexplained fetal intrauterine death.

Foster (I980), classified diabetes mellitus into : Juvenile-onset (Insulin-Dependent, Ketosis-Prone), and a Maturity-onset (Non-Insulin-Dependent, Ketosis-Resistant) types. This is not a cutting classification, as the picture of maturity-onset diabetes may occur in the very young, while that of the insulin-dependent type may begins after the age of 40 years; but in fact, this classification helps in the treatment and prognosis of the patients under normal, not stress or other conditions. He puts the main differences between the two types as listed in table I (later).

Karam (I98I), subdivided non-insulin-dependent diabetes mellitus into two subgroups which are distinguished by the absence or presence of obesity :

A. Non-Obese Non-Insulin-Dependent Diabetics :

There is absent or delayed early phase of insulin release