GLYCOSYLATED HEMOGLOBIN AND THE RISK OF MICROALBUMINURIA IN PATIENTS WITH NON INSULIN DEPENDENT DIABETES MELLITUS

THESIS

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Master Degree in Internal Medicine

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بسم الله الرحمن الرحيم

اقرأ باسم ربك الذي خلق

خلق الإنسان من علق

اقرأ وربك الأكرم الذي علم بالقلم

علم الإنسان ما لم يعلم

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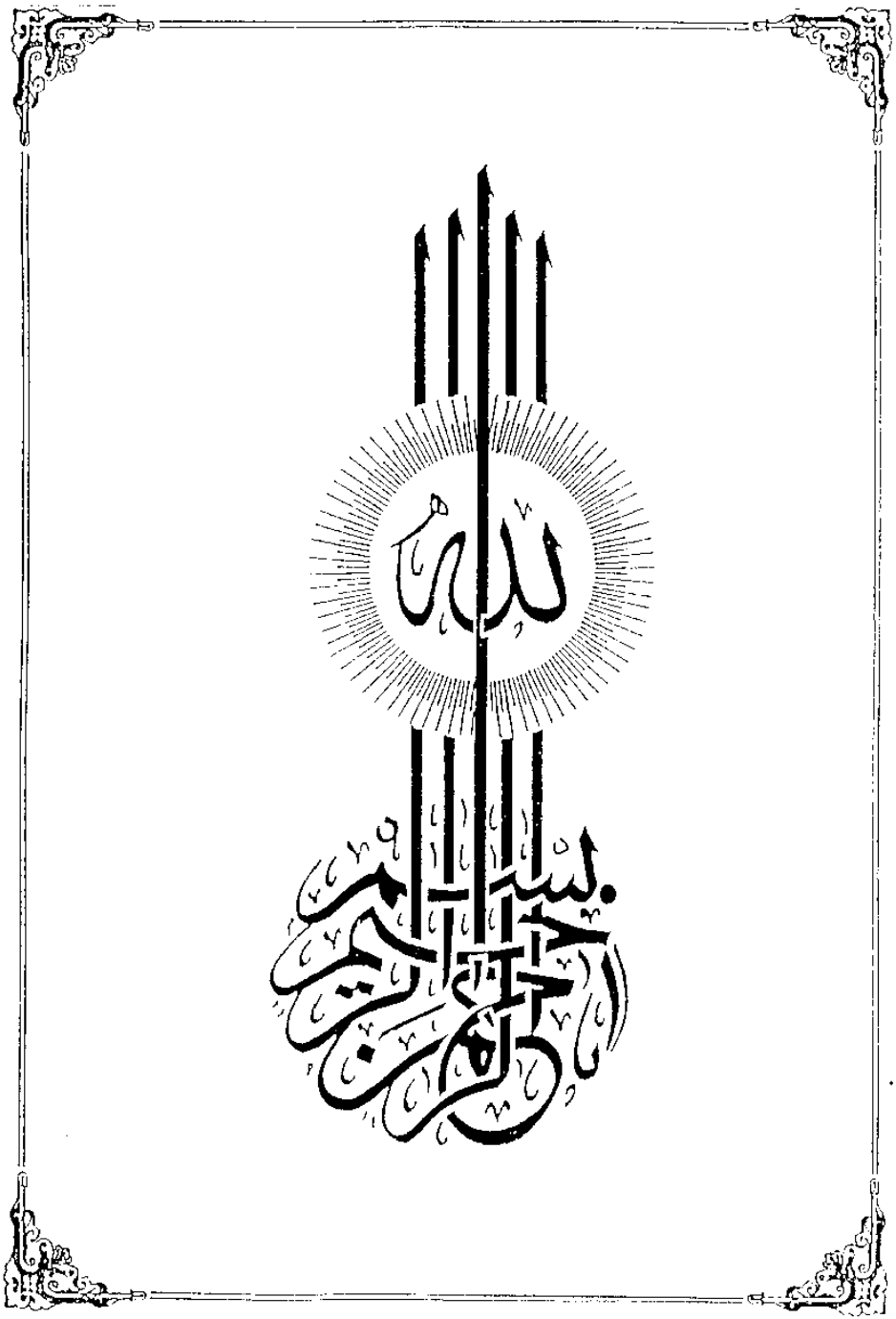

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ABBREVIATIONS

DM	:	Diabetes mellitus.
IDDM	:	Insulin dependent diabetes mellitus.
NIDDM	:	Non-insulin dependent diabetes mellitus.
TIA	:	Transient-ischaemic attack.
HDL	:	High density lipoprotein.
LDL	:	Low density lipoprotein.
GFR	:	Glomerular filtration rate.
RPF	:	Renal plasma flow.
Hb	:	Haemoglobin.
AER	:	Albumin excretion rate.
PG	:	Prostaglandin.
RNA	:	Ribonucleic acid.
DNA	:	Deoxyribonucleic acid.
IgG	:	Immunoglobulin G.
IGF1	:	Insulin like growth factor 1.
ACE	:	Angiotensin-converting enzyme.
CSII	:	Continuous subcutaneous insulin injections.
ESRF	:	End-stage renal failure.
RRT	:	Renal replacement therapy.
CAPD	:	Continuous ambulatory peritoneal dialysis.

INTRODUCTION AND AIM OF THE WORK

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Diabetes mellitus is associated with serious complications of the eyes, kidneys, heart, blood vessels and other organ systems.

The relation between the development and progression of micro vascular complications of diabetes including diabetic nephropathy and glycemic control has been debated for many years, in part because of the inadequacy of methods to assess the glycemic control over the long term. Traditional methods of measuring glucose in blood and urine are of limited value for this purpose, and it is only with the development of glycohemoglobin (G-Hb) testing that accurate, objective measurement of long term glycemic status has been possible.

Studies indicate that undermost circumstances, G-Hb is a reliable measure of average blood glucose concentration during the preceding two to three months **(Little et al., 1992).**

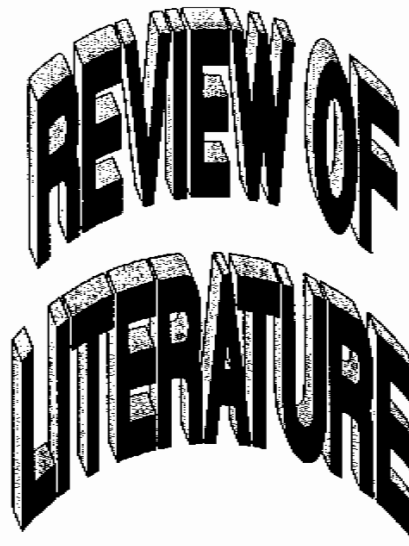
We now know for sure that blood glucose levels are the main determinant for initiation and progression of diabetic microvascular complications including diabetic nephropathy **(Hanssen, 1994).**

Some prospective, randomized studies have indicated that lower blood glucose cocentrations retard the progression of diabetic nephropathy **(Per Reichard et al., 1993).**

The risk of microalbuminuria in diabetic patient increases abruptly have the HbA1, value of 10.1% (equivalent to HbA_{1c} of 8.1%) suggesting that efforts to reduce the frequency of diabetic nephropathy should be focused on reducing HbA1, values that are above this threshold **(Andzej et al., 1995).**

AIM OF THE WORK:

The aim of the work is to study the effect of blood glucose control on occurrence of microalbuminuria in type II DM.


REVIEW OF
LITERATURE

CHRONIC COMPLICATIONS OF DIABETES

The most important chronic or late complications of diabetes include occulor complications, nervous complications, cardiovascular complications, peripheral vascular complications, skin complications and diabetic nephropathy.

*** Occular complications:-**

The most important occular complications is diabetic retinopathy eye disease is common in diabetes and permanent loss of vision is one of the most striking and feared complications. Approximately 25% of all newly reported cases of bindness are attributed to diabetes. When diabetes of all ages and types are considered together, the incidence of blindness from diabetic retinopathy is 2% per year in all diabetics and 0.6% per year in diabetics with retinopathy **(Unger et al., 1992).**

- Two major general categories of diabetic retinopathy exists.

I) Background (non proliferative) retinopathy:-

The prevelance of background retinopathy increases with age and after 25 to 30 years of diabetes, about 90% of patients have demonstrable retinal lesions. Background or simple retinopathy includes dilatations, constriction and tortousity of vessels, microaneurysms, dot-shaped inner retinal hemorrhages, flame-shaped retinal hemmorhages and hard or soft exudate. Macular edema is common and can lead to serious loss of vision **(Unger et al., 1992).**

2) Proliferative retinopathy:-

Proliferative retinopathy,the most serious complication of diabetic ophthalmopathy, carries a high risk of vitreous hemorrhage, scarring, retinal detachment and blindness. Blindness is reported to occur in 43% of insulin-dependent diabetes mellitus (IDDM) patients and 61% of non-insulin dependent diabetes mellitus (NIDDM) patients within 5 years after the onset of proliferative retinopathy **(Unger et al., 1992).**

*** Nervous complications:-**

The most important nervous complications of diabetes are diabetic neuropathy end cerebrovascular complications.

A) Diabetic neuropathy:-

It includes the following types:-

1) peripheral sensorimotor neuropathy:-

It affects most distal parts of the longest nerves (lie the toes and the soles of the feet). The hands are affected only with severe and long standing neuropathy. The prevalence of neuropathy is about 7.5% on discovery of diabetes increasing to about 50% after 25 years. The neuropathy is symmetrical and predominantly sensory and includes i) Pain which is sharp, stabbing or burning in nature, ii) Paresthasia, iii) tingling and iv) numbness **(Macleod, 1989).**

2) Diabetic mononeuropathy:-

Spontaneous mononouropathies, external pressure palsies and entrapment neuropathies are all more common in diabetics. Carpal tunnel syndrome occurs in up to 10% of patients seen in

diabetic clinics.of cranial nerves, the third and sixth are most often involved **(Macleod, 1989).**

3) Diabetic automonic neuropathy:-

Numerous symptoms can be ascribed to diabetic autonomic neuropathy. Those with the most clinical importance include, impotence in men, dizziness due to postural hypotension,nausea and vomiting due to gastroparesis, tachycardia with no sinus arrhythmia and small pupil **(Mackleod, 1989).**

B-Cerebrovascular complications :-

Cerebral infarction has been claimed to occur in one and half two times more frequently in persons with diabetes than in persons without diabetes. It has been observed that the ferequency of transient ischemic attock (TIA) was three times greater than expected in diabetic patients than in non diabetics and the co existence of hypertension further increases the frequency of TIAs or stroke in diabetic patients **(Tarsy, 1994).**

*** Cardiovascular complications:-**

Cardiovascular disease is more common in diabetics than in the population as a whole **(Stout, 1989).**

- The cardiovascular complications of diabetes include:-

1) Coronary heart disease :-

The presence of diabetes dramatically reduces the survival after myocardial infarction. The five years mortality rate after acute myocardial infarction may be as high as 55% in individuals with diabetes compared with 30% in those without