Study Of Renal Doppler And Microalbuminuria In Diabetic Patients

Thesis submitted for partial fulfillment of M.Sc. Master Degree in Internal Medicine

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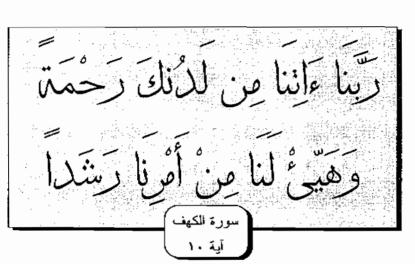
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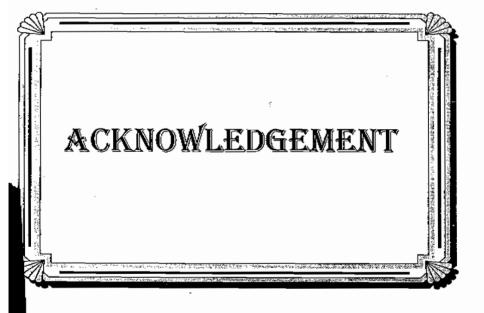
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الله العظيم





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INTRODUCTION AND AIM OF THE WORK

Introduction and Aim of the Work

Diabetic nephropathy is a common cause of native kidney dysfunction and one of the most common causes of end stage renal diseases. The renal changes associated with diabetes mellitus are complex, ranging from early hyperfiltration with an increased glomerular filtration rate to late nephrosclerosis and fibrosis with azotemia.

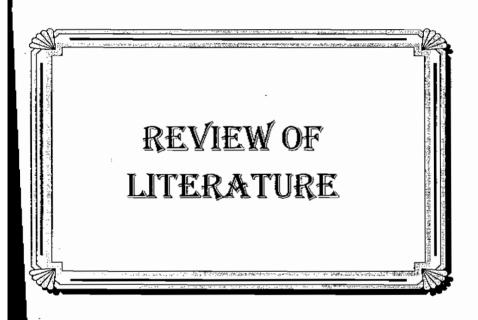
Microalbuminuria is defined as abnormally elevated urinary albumin excretion but without clinical proteinuria i.e. a raised urinary albumin excretion rate, but below the level of albustix detection (Viberti et al., 1982). The albustix test only becomes positive at a level around 100-150 µg/min provided there is normal urine flow (Mongensen, 1986). Microalbuminuria is considered present when the urinary albumin excretion is greater than 20 µg/min. This level of urinary albumin excretion corresponds to approximately 30-300 mg/24 hrs (Mongensen, 1987).

Mortality in diabetes mellitus is related mainly to its renal and cardiovascular sequelae. Microalbuminuria identifies those at increased risk of both complications possibly because

microalbuminuria is a marker of generalised endothelial dysfunction (Strehower, CD; Donker, AJ, 1993).

Moreover, Platt JF and his associates (1994) reported that Doppler ultrasound provides an accurate indication of renal function in diabetic patients. Analysis of the Doppler spectrum of the intrarenal arteries in conjunction with careful evaluation of the renal cortical echogenicity may be helpful in sonographic prediction of the renal functional states in patients with diabetes mellitus (Kim, SM et al., 1992).

The aim of the present work is to detect the very early renal changes by detection of microalbuminuria and also the changes in renal blood flow using Doppler ultrasonography in diabetic patients.



Diabetes Mellitus

Definition:

It is a state of chronic hyperglycemia oftenly occurring due to environmental and genetic factors or both acting together as defined by the WHO Expert Committee in 1980.

Classification:

This classification is made according to the type of diabetes and not according to the age of onset it was made by the WHO Expert Committee in 1980.

I- Clinical types:

A) Diabetes mellitus:

- 1-Type I insulin-dependent (IDDM)
- 2-Type II non-insulin dependent (NIDDM):
 - a- Obese
 - b- Non-obese
- 3-Other types including diabetes mellitus associated with certain conditions and syndromes.
 - a- Pancreatic disease
 - b- Insulin receptor abnormalities

- c- Disease of hormonal actiology
- d- Drug or chemical induced conditions
- e- Some genetic syndromes

B) Impaired glucose tolerance:

- 1-Non obese
- 2-Obese
- 3-Impaired glucose tolerance associated with certain conditions and syndromes.

C) Gestational diabetes

II- Normal glucose tolerance but increased risk of developing diabetes:

- A) Latent diabetes or previous abnormalities of glucose tolerance.
- B) Prediabetes or potential abnormalities.

Diabetes mellitus is defined as a syndrome involving a variety of metabolic problems, it is a single disease entity. The most important cause of this syndrome is an absolute or relative deficiency, or inefficiency of insulin and its function (Welborn, 1984).

This syndrome is associated with accelerated atherosclerosis and also predisposes to certain specific microvascular abnormalities including retinopathy, nephropathy and neuropathy also the resistance is lowered towards infection specially if poorly controlled diabetes (George and Cahill, 1985).

Non-Insulin Dependent Diabetes Mellitus

It is usually insidious in onset occurring in adults near the age of 45 or after. Yet, it sometimes occur in patients of young age groups. The important and common complications in this type are retinopathy and nephropathy although not as severe as in type I diabetes mellitus. Ketoacidosis rarely occurs in cases of unusual stress (Marble & Fagusen, 1985).

NIDD patients fall into two categories, obese (20% or more above the ideal weight) which constitute the majority, and non obese (Marble and Ferguson, 1985). Hyperglycemia and loss of weight are strongly related, as hyperglycemia and glucose tolerance are improved by loss of weight and maintenance at the lower level attained (Sandahl et al., 1982).