Correlation between IGT and Microalbuminuría in Type-2 Diabetes Mellitus Patients

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Abstract

Impaired glucose tolerance (IGT) is one of the metabolic diseases caused by uncontrolled carbohydrate metabolisms in type-2 diabetes mellitus. The study population was selected based on the results of glucose tolerance test (GTT, 75G). IGT was defined between 140-199 mg/dl of serum glucose after two hour Oral 75g glucose consumption. The results inferred that the urinary albumin secretion in both samples was significantly found in twenty subjects (20) with IGT with microalbuminuría and 18 patients from this group developed diabetes mellitus within a year follow up period. Moreover, 4 patients with IGT without microalbuminuría also developed diabetes mellitus during the one year study period. According to ADA, IGT patients with albuminuría were at risk of progression to diabetes mellitus than subjects without albuminuría.

Keywords: Impaired Glucose Tolerance, Type-2 Diabetes mellitus, Microalbuminuría.

INTRODUCTION

Impaired glucose tolerance (IGT) is one of the metabolic diseases caused by uncontrolled carbohydrate metabolisms which are located between the normal glucose tolerance (NGT), and type 2 diabetes. This disorder has significant pathophysiological effects on insulin sensitivity, and secretion as well as cardiovascular diseases [1]. Epidemiological studies have considered microalbuminuría (MAU) as a risk factor for atherosclerosis, coronary artery disease, and other vascular disorders in patients with type 2 diabetes, and IGT [2].

Microalbuminuría refers to a slight increase in secretion of albumin in urine, and is a sign of progression towards nephropathy in patients with diabetes. It is a clue which helps us predict the occurrence of cardiovascular disorders in both patients with or without diabetes. The risk of microalbuminuría is correlated with plasma glucose level, and the duration of hyperglycemia in patients with diabetes [3,4]. Glycemic control in these patients can prevent the development, and progression of microalbuminuría, but this issue has not been well-documented about IGT and disorder yet. Some studies conducted in this regard have shown that IGT is a more important risk factor developing microalbuminuría [5, 6]. At present, no special treatment and diagnostic measures is advised in patients with IGT. Considering that early diagnosis and control of microalbuminuría can Slow its progression towards microalbuminuría and renal failure, and also prevent cardiovascular complications, the present study was and IGT [7].

METHODS

This study was performed from 2018 to 2019 in Venkataeswara hospital, Chennai. Exclusion criteria were as follows: Over diabetes mellitus, hypertension, urinary tract infection (UTI) and treatment with corticosteroids or spironolactone, ARBs, (Angiotensin Receptor Blockers) and ACEIs (Angiotensin Converting Inhibitors). The study population was sequentially selected based on the results of glucose tolerance test (GTT, 75G). IGT was defined between 140-199mg/dl of serum glucose after two hour Oral 75g glucose consumption. The study was approved by the local ethics Committee, and informed consent was obtained from all participants. The quantitative urine albumin-creatinine (Cr) ratio in morning spot urine samples were used for standard microalbuminuría determination. For these Measurements, the automated clinical chemistry analyzers by immunoturbidimetry.
assay were used. Microalbuminuria was defined as 30-300mg/g Cr in two random measurements with a month interval. The subjects with different results in these two random tests (one positive and one negative) were asked for testing the third sample. All of our cases were followed up for one year, we did not have any drop out in our patients follow, and their blood sugar and urine albumin levels were measured every 2 months. For each participant, HbA1c was requested at least four times in a one year follow up. We used chromatography method with bio-system kit for this test. The obtained data was analyzed by SPSS software. Correlation between Blood glucose and urine albumin was evaluated.

RESULTS

The mean (SD) age of the subjects was 45.2(+10) years in the IGT and control groups. Fifty subjects with normal glucose tolerance, 20 were female (40%) and 30 were male patients (60%). Fifty subjects with IGT, 25 were female (50%) and 25 were male patients (Figure 1). Basic blood glucose 2 hrs after 75gr oral glucose in the two groups (IGT and control groups) was taken (Figure 2). Microalbuminuria was not seen in the control group. Urine albumin secretion in both samples measurement was significantly twenty subjects (20) with IGT group had microalbuminuria and 18 patients from this group developed diabetes mellitus within a year follow up period. Moreover, 4 patients with IGT without microalbuminuria also developed diabetes mellitus during the one year study period. According to ADA, IGT patients with albuminuria were at risk of progression to diabetes mellitus than subjects without albuminuria.

Fig 1: Microalbuminuria Prevelance in IGT and Normal Population

Fig 2: Progression towards Diabetes Mellitus in Subject with IGT
**DISCUSSION**

The current study revealed that the urinary albumin secretion is significantly higher in IGT groups than in the NGT group. IGT patients with Microalbuminuria were at risk of progression to diabetes mellitus than subjects (IGT) without Microalbuminuria [8]. Normal glucose tolerance (NGT) patients are less likely to have Microalbuminuria, and are less likely to develop diabetes mellitus. Only one trial to date, the Diabetes Prevention Program, has directly compared lifestyle intervention with pharmacotherapeutic intervention for the prevention of diabetes in people with IGT [9, 10]. It found a significantly lower risk for progressing to DM with aggressive lifestyle intervention compared with taking metformin (4.8 percent versus 7.8 percent per year; especially in individuals 60 years of age or older.

Lifestyle modifications may be difficult to maintain, in people with IGT the following strategies have been shown to increase the likelihood of patient success:
1. Patient self-monitoring
2. Realistic and stepwise goal setting
3. Stimulus control
4. Cognitive strategies
5. Social support
6. Appropriate reinforcement

The structured lifestyle interventions included training people with IGT to achieve modest weight loss through diet and physical activity. Important aspect of therapeutic lifestyle management that should be discussed with every patient with IGT.

**CONCLUSION**

The Present study suggests and recommends the following to the management of IGT.
1. Consistency in day-to-day carbohydrate intake
2. Limitation of sucrose-containing or high-glycemic index foods
3. Adequate protein intake
4. Weight management

**REFERENCES**