

ROLE OF ITOPRIDE IN MINIMIZING POST PRANDIAL GLUCOSE EXCURSION IN TYPE 2 DIABETIC PATIENTS

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ABSTRACT

Objective: To determine the effect of itopride (Prokinetic) drug on Post Prandial Glycemia in type 2 DM.

Material and Methods: This study was conducted in Department of Medicine and Department of Pharmacology, Khyber Teaching Hospital, Peshawar from January 2012 to December 2012. Total of 100 patients were enrolled in the study and categorized into two treatment groups. Each group contain 50 patients. 1st group (Control group) was given oral anti-diabetic agents and Placebo. 2nd Group (Treatment Group) was given oral anti-diabetic agents along with itopride. Fasting and two hours Post Prandial blood sugar was done. Difference between fasting and 2 hours postmeal glycemic levels were found out and then compared in the two groups.

Results: Mean fasting and post load glucose for Group 1 patient was 155.24 mg/dl and 2 hour post load glucose was 331.80 mg/dl. Group II mean fasting blood sugar was 159.88 mg/dl and mean 2 hours Post Prandial blood sugar was 222.40 mg/dl. Mean difference in fasting and 2 hours post prandial blood sugar was 176.56 mg/dl and 62.52 mg/dl respectively in Group I and II.

Conclusion: This study showed significant decrease in fasting and post prandial blood sugar level in patient taking itopride as compared to control group.

Key Words: Itopride, Incretin, Post prandial, diabetes mellitus, Type II.

INTRODUCTION

Diabetic gastropathy or Delayed gastric emptying is one of the common complication of Type 2 DM and is one of the common cause of Post Prandial glycemic surge¹. Due to delayed Gastric emptying there is delayed delivery of macronutrient to intestine as a result there is decrease incretin Secretion from Gut. Decrease incretin means decrease secretion of insulin from beta cell of pancreas. Itopride is an orally active gastroprotective with moderate antiemetic action with no cardiac side effect as it barely activate prolactin and does not prolong QT interval². When given to diabetic patient will improve gastric emptying resulting in increase incretin. Increase incretin means increase insulin secretion and thus minimizing post prandial Glycemic surge. Primary defect leading to delayed gastric emptying in DM is vagal autonomic neuropathy³⁻⁴.

Incretin are gut hormones. There are two main incretin hormone, GIP (glucose-dependent insulinotropic peptide) and GLP-1 (glucagonlike peptide). Both of them are responsible for postmeal load control of glycemia⁵. Diminished incretin response due to delayed gastric emptying may contribute to impaired

insulin secretion in patient with type 2 DM⁶.

Incretin are secreted into the blood stream in response to nutrient ingestion⁷. In diabetic patient there is delay in gastric emptying due to autonomic neuropathy⁸. Augmenting Gastric movement by giving itopride can minimize post prandial surge. In Diabetic patients having delayed gastric emptying result in delayed incretin secretion which is one of the most common cause of poor Post prandial Glycemic control⁹.

MATERIAL AND METHODS

It was a comparative study of 100 patient with type 2 diabetes mellitus from January 2012 to December 2012; done in medical wards and Department of Pharmacology Khyber Teaching Hospital. Type 2 DM patient having clinical feature of nausea, flatulence, bloating and early satiety were included in the study, while patient with Malignancy, CAD, and COPD were excluded from study. Patients were categorised into two groups each having 50 patients. 5 ml of blood was obtained by venipuncture, serum separated and used for estimating plasma glucose level. Group I was given usual oral anti diabetic medication along with Placebo. Group 2 was given itopride along with oral anti diabetics in fasting state. Premeal and two hours post meal blood sugar was estimated. Difference between premeal and 2 hours postprandial glycemic level were found out and then compared.

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RESULTS

A total of 100 patient were enrolled in this study. Age range was from 40 years to 60 years with mean age of 50 years. Male patient were 24 and 26 were female in group I. Mean age in group I was 49.9 years while mean age in Group II was 49.02. Mean fasting blood sugar of group I was 155.24mg/dl and mean 2 hour post prandial sugar was 331.8mg/dl. Mean fasting blood sugar of group II was 159.88mg/dl and mean 2 hour post prandial sugar was 222.40mg /dl. In group 1 mean difference between two hour post prandial and fasting sugar was 176.56mg / dl. In group II mean difference between two hour post prandial and fasting sugar was 62.52 mg/dl.

DISCUSSION

Diabetic patients are at increased risk of developing complication including microvascular complication retinopathy, neuropathy and C.V.D cardiovascular disease. The diabetic control and complication trial (DCCT) and UK prospective diabetes study (UK PD)10 showed that measuring HbA1C and improving glycemia reduced microvascular complication of Diabetes. Most patient with type 2 diabetes fail to achieve good glycemic control that is why disease remain a major cause of morbidity and mortality¹¹⁻¹⁴.

A diabetic patient with good glucose control has HbA1C level that is close to are within reference range. A retrospective study of 47970 diabetic patients shows HbA1C more than 6.5% had an increased mortality rate, but later international study contradicted these findings¹⁵. HbA1C control depends upon both pre and post prandial glucose level. Regulation of post prandial glycemia is complex process. Important cause of raised post prandial glucose are increase absorption of dietary glucose, increase glucagon and lost of early insulin response due to delayed gastric emptying. Early insulin response is augmented by action of incretin hormone on β cell of pancreas¹⁶.

Endocrine Glucagon like peptide (GLPI) in an important peptide hormone secreted from endocrine cells in the small intestine¹⁶ GLPs not only activate insulin secretion but also inhibit glucagon secretion¹⁷ thus minimizing Post Prandial Glucose excursion. The main stimulus for secretion of incretin is presence of food (nutrient) in gut. Delayed gastric emptying in type 2 DM cause decrease incretin release which decreases early insulin response, resulting in increase Post Prandial glucose surge. Addition of itopride (Prokinetic) drug before meal facilitate food delivery to intestine, increasing incretin secretion and thus minimizing post prandial glycemic excursion.

The result of our study showed that Augmenting the gastric motility by use of itopride increases incretin secretion and decreasing post prandial glycemic surge. These results are consistent with result of Asim Zulfiqar et al¹⁸.

We also compared our results with the results of study done by Stevens JE et al who studied the role of itopride in improving diabetic control and diabetic gastroparesis. Steven JE analysis showed that glycemic control is not affected by addition of itopride, but in their study they have selected patients who were insulin dependent type 2DM. Insulin is required in treatment of type 2DM when beta cell mass of pancreas is unable to secrete insulin in response to incretin, meaning that there is no beta cell mass, incretin although released, from the intestinal cell in response to food delivery will be unable to secrete insulin, as there is no beta cell in pancreas to secrete insulin.

CONCLUSION

Significant reduction was observed in mean differences in fasting and 2 hours post prandial glycemia in patient taking itopride as compared to diabetics not taking itopride.

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