Effect of Domperidon on Gastric Emptying in Diabetic Patients with Gastroparesis

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The effect of Domperidon on gastric emptying time in 20 diabetic patients with gastroparesis was evaluated and compared to a control group consisting of 10 patients. In the control group, none of the patients had any gastrointestinal symptoms and their barium roentgenograms were normal. Preliminary to our study all patients have been evaluated using radiology, endoscopy and dynamic scintigraphic examination. After this evaluation domperidon (molitium) (eczacıbaşı) has been started 4x10 mg daily. Two weeks after the radioisotopic baseline study and under domperidon medication, the patients were questioned about their symptoms and the gastric emptying times were restudied employing the same protocol. In conclusion, it is found that domperidon treatment in diabetic patients with gastroparesis is effective symptomatically and shortens significantly the gastric emptying time without any side effects.

Key words: Gastric emptying, Domperidon, Radiosotope

Gastroparesis is a motor disorder characterized by delayed emptying of the gastric content without any mechanical obstruction. The pathophysiology of gastroparesis is a complex incident consisting of electrophysiological, hormonal, peripheral and central neural mechanisms(1). It is known that dopamin has an important role as a neurotransmitter in gastric emptying(2-3). A delayed gastric emptying time can be corrected by dopamin receptor blockers like metoclopramide, but it is known that these drugs have central side effects(4).

Domperidon is a dopamin receptor blocker which does not penetrate the blood-brain barrier and for this reason has no central side effects. It increases lower esophageal sphincter pressure and decreases gastric emptying period(5-9). It has been found useful in the therapy of symptomatic diabetic gastroparetic patients(1-11).

The aim of our study was to evaluate the effects of domperidon on gastric emptying time on diabetic gastroparetic cases.

MATERIALS AND METHODS
20 diabetic patients between the ages of 25–65 (median 50) were included in our study. Three of these patients were type 1 diabetics taking insulin, 17 were type 2 diabetics using oral hypoglycemic drugs. All patients had symptoms of nausea, vomiting, abdominal bloating, lack of appetite, untimely hunger satisfaction. Symptom fre-
quency 1–2 per week is accepted as light (score 1), 3–4 medium (score 2) and over as heavy (score 3) cases. In the control group; none of the patients had gastrointestinal symptoms and their barium roentgenograms were normal.

Preliminary to our study, the probability of anatomical obstruction, active ulcers, cancer and other structures were excluded in all patients using radiology and endoscopy. Ten days prior to and during our study period, use of drugs which might effect the gastric motility were prohibited. After a 12 hour period of hunger all patients were examined following the ingestion of a semisolid food.

The semisolid food was prepared including an egg, a piece of cheese, bread and 60 ml of milk. 1 mCi of Tc–99m Sulfur Colloid was added in to the milk and the patient was asked to begin chewing the solid parts of the food, taking some milk into the mouth chewing again and then swallowing but never drinking the milk directly. A kinetic study was performed with the patient lying in supine position; taking 120 frames in 60 minutes each frame being 30 seconds. Using the data obtained, a region of interest (ROI) was drawn along the borders of the stomach and a time activity curve was obtained for each patient. On the time activity curves which show exponential decrease, first the decrease constant (X) were calculated for each patient using the formula A_t = A_0 e^{-Xt} where A_0 is the activity at T_0 and A_t is the activity at T_60 min. Then T_1/2 was calculated using the formula T_1/2 = 0.693/X [12].

After the study was over, domperidone (motilium) (eczacıbaşı) was started to be given 4x10 mg daily. After two weeks the patients were questioned about their symptoms and their gastric emptying times were restudied with the same protocol. Statistical evaluation of these quantitative results and the scoring before and after domperidone therapy were done by paired t tests.

**RESULTS**

In 20 patients the mean gastric emptying time was calculated as 102.05±65.51 (±SD) minutes before domperidone and 70.85±26.52 minutes after domperidone. In the control group; the mean gastric emptying time was found to be 66±18. The difference was statistically significant (p<0.001) (Figure 1). Mean symptom score was 3±0 before treatment and 1.65±0.67 after treatment and the result was again statistically significant (p<0.001) (Figure 2). No side effects were detected.

**DISCUSSION**

In diabetic patients gastroparesis impairs the plasma glucose regulations. In the treatment of gastroparesis prokinetic agents such as metoclopramide, cisapride, domperidone, eritromisin, bethanecol are used to increase the intestinal transit time [13]. Domperidone is a derivative of benzimidazol and antagonizes the inhibitor effect of dopamin on the upper gastrointestinal system [14]. As the blood–brain barrier penetration is weak, it does not cause extrapyramidal symptoms and dystony. It might the level of prolactin being usually subclinically [15]. Gynecomastia occurrence in male patients is rare.

In various clinical studies it has been observed that domperidone treatment of the diabetic patients with gastroparesis was beneficial by oral treatment of 10 mg domperidone every 4 hours. Heer and colleagues showed that there was improvement in gastric symptoms severely [11]. Mc Callum and colleagues has proven that by oral and intravenous treatment of domperidone gastric emptying time decreases and symptoms disappear [13]. Our results also show that, domperidone treatment decreases the delayed gastric emptying time of the diabetic patients with gastroparesis.
Figure 1: Gastric emptying time after and before domperidone

Figure 2: Symptoms score after and before domperidone
CONCLUSION
In our study domperidon treatment decreased gastric emptying time and improved the symptoms in diabetic patients with gastroparesis. As domperidon has rare central effects, we can accept its superiority over other dopamin antagonists and suggest that it should be the first drug to be chosen for the treatment of gastroparesis in diabetic patients.

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REFERENCES