

## Gastrointestinal signs and symptoms among persons with diabetes mellitus

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### ABSTRACT

**Aim:** To determine the prevalence of gastrointestinal symptoms and signs among persons with diabetes mellitus in a specialist hospital.

**Background:** Gastrointestinal symptoms and signs are common among patients with diabetes mellitus. Morbidity from **Patients and methods:** In this descriptive, cross-sectional study, subjects from the general population with diabetes (n=200) were recruited for this study. Subjects were randomly chosen from patients known to have diabetes, (type I&II), attending the diabetes clinic at Sina University Hospital, in Tabriz during 2003. The questionnaire recorded gastrointestinal symptoms among the subject population.

**Results:** 91% and 9% of patients had Type II and I diabetes, respectively. Sixty seven percent of them had poor controlled diabetes and only 3% had well controlled diabetes. Gastrointestinal symptoms and signs were reported in 92% of patients. The common GI symptoms were constipation (59.5 %), followed by bloating (44 %), abdominal pain (31%), dyspepsia (30%), and mass protruding through anus (22.5%). Abdominal tenderness on deep palpation was the commonest clinical sign (54%). GI symptoms were more prevalent in subjects aged 60-69 years (97.2%). Seventy four percent of patients with GI signs and symptoms had complications such as neuropathy 61.5% and retinopathy associated with neuropathy 38.5%.

**Conclusion:** The prevalence of GI symptoms and signs in the population studies was higher than that reported from other populations, and there is a relationship between glycaemic control and complications of diabetes in diabetic subjects.

**Keywords:** Diabetes mellitus, Gastrointestinal, General population, Sign, Symptom.

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### Introduction

Gastrointestinal sign and symptoms are common in diabetes mellitus and usually attributed to autonomic neuropathy (1-5). Studies suggest that GI symptoms affect quality of life adversely (6-10) and represent a substantial cause of morbidity in patients with diabetes (3), the available epidemiological data relating to the prevalence of GI symptoms in

diabetes is conflicting and can be challenged on methodological grounds (2, 11).

Schvarcz et al. (12) evaluated the prevalence of GI symptoms in a non-selected, population-based cohort of 110 young adult patients with long-standing type 1 diabetes mellitus, compared with age- and sex-matched control subjects. In the patients with diabetes, there was an increased prevalence of upper GI symptoms, such as anorexia and vomiting, whereas there was no difference in the frequency of symptoms referable to the lower GI tract. The prevalence of GI symptoms was

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significantly greater in women than in men and in those subjects with the worst glycemic control, as assessed by glycosylated hemoglobin concentrations. Janatuinen et al. (13) found that the prevalence of upper GI symptoms including abdominal pain, constipation, and diarrhea was similar in patients with diabetes and controls. In that study, only middle-aged patients with type 1 or type 2 diabetes mellitus who were treated with insulin or oral hypoglycemic drugs were evaluated, and the questionnaire used to evaluate symptoms was not a validated measure. Finally, a recent community-based study from the United States (13) failed to detect differences in prevalence rates for GI tract symptoms in persons with or without diabetes mellitus, except for a lower prevalence of heartburn and an increased prevalence of constipation or laxative use in residents with type 1 diabetes mellitus. The findings, however, were surprising as the study did not report a single subject with diarrhea. Furthermore the controls for type 1 diabetes

mellitus reported more constipation compared with the older group of controls for persons with type 2 diabetes. Furthermore, the authors reported no differences in peripheral neuropathy and minor differences in autonomic neuropathy between subjects with type 1 diabetes and age-matched controls.

We devised an epidemiological survey using a questionnaire, and we hypothesized that troublesome GI symptoms would be more prevalent in patients with diabetes compared with community controls, after adjusting for age and sex. Furthermore, we hypothesized that GI symptoms would be associated with poor glycemic control.

## Patients and Methods

This descriptive, cross-sectional, referral-based study was conducted during 2003 in Tabriz, Iran. Among the diabetic patients who had been referred to a metabolic clinic, 200 patients were selected

**Table 1.** frequency of gastrointestinal symptoms in patients with diabetes mellitus, Tabriz, Iran

	Abdominal Pain	dyspepsia	diarrhea	constipation	bloating	heartburn	melena	hematochezia	Mass protruding Through anus
Sex									
Male	17	23	2	51	37	15	9	10	36
Female	54	37	4	68	51	36	8	7	29
Type of Diabetes Mellitus									
Type I	8	4	1	0	6	3	0	2	0
Type II	54	54	5	119	82	48	17	15	65
P-value	NS*	NS	NS	NS	NS	NS	NS	NS	NS
Complication									
Yes	51	50	6	13	71	45	12	15	56
No	11	10	0	106	17	6	4	2	9
P-value	0.001	0.001	0.001	0.01	0.007	NS	NS	0.012	0.006
Glycemia control									
Yes	15	18	2	35	30	9	1	2	14
No	47	47	4	84	58	42	16	15	51
P-value	NS	NS	0.021	0.001	NS	NS	NS	NS	0.012
Duration of Diabetes Mellitus									
Under 5 years	32	27	4	39	36	21	11	6	25
5-10 years	17	15	0	37	29	14	2	5	16
More than 10 years	13	18	2	43	23	16	4	6	22
P-value	NS	NS	NS	0.014	NS	NS	NS	NS	NS

\*NS: Not Significant

**Table 2.** Frequency of gastrointestinal signs in patients with diabetes mellitus, Tabriz, Iran

	Hepatomegaly	Splenomegaly	Epigastric tenderness	Abdominal hernia	Icterus	Tenderness on deep palpation
Sex						
Male	5	1	7	6	2	31
Female	7	4	31	8	2	77
Type of Diabetes Mellitus						
Type I	0	0	0	2	0	6
Type II	12	5	38	12	4	102
P-value	NS*	NS	NS	NS	NS	NS
Complication						
Yes	10	3	38	11	2	21
No	2	2	0	3	2	87
P-value	NS	NS	NS	NS	NS	NS
Glycemia control						
Yes	4	2	10	10	2	31
No	8	3	28	4	2	77
P-value	NS	NS	NS	0.003	0.009	NS
Duration of Diabetes Mellitus						
Under 5 years	4	1	12	8	2	48
5-10 years	6	1	11	4	2	32
More than 10 years	2	3	15	2	0	28
P-value	NS	NS	NS	NS	NS	NS

\*NS: Not Significant

randomly. A questionnaire has been designed including age, sex, past medical history, GI symptoms and signs, type of diabetes mellitus, duration and complications of diabetes mellitus. Studied patients were interviewed by specialists and underwent a physical examination.

Results are expressed as mean  $\pm$  standard deviation (SD). Comparisons between means were carried out using the Student's unpaired and paired t test. The chi-square and Fisher exact tests were used to comparison categorical variables.  $P < 0.05$  was considered statistically significant. The study project was endorsed by the ethics committee of Department of Endoscopy Sina University, Tabriz University of Medical Sciences, Iran.

## Results

Of the 200 subjects interviewed, ninety one percent of patients had type II diabetes. Thirty three percent of studied patients had appropriate control on

their hyperglycemia and 67% of patients had poor controlled diabetes (40.2% were male). The prevalence of complications of diabetes reported in our diabetic patients were 74% (30% were male). 61.5% of studied patients had neuropathy, 38.5% had retinopathy and also neuropathy. There were no evidences of nephropathy in any patients. Forty two diabetic patients had the history of hypertension, 26 persons had the history of hyperlipidemia and 61 persons had hypertension and also hyper lipidemia. Neuropathies in complicated diabetic patients were reported in 23.8% compared with 19.2% in diabetic without any other complications.

GI symptoms and signs were reported in 92% of patients and 40% of them were male. The most common symptoms were constipation followed by bloating, mass protruding through anus, abdominal pain, and dyspepsia (Table 1). Seventy two percent of diabetic patients who had constipation also had complications of diabetes. Sixty three percent of them had poor controlled diabetes and 74.1% had

diabetes for more than 5 years. The most frequently observed sign was abdominal tenderness on deep palpation (Table 2). GI symptoms prevalence in different age groups was as follow: 71.4% in aged 20-29 years, 77.7% in 30-39 years, 82.3% in 40-49 years, 93.3% in 50-59 years, 97.2% in 60-69 years, and 100% in 70-79 years. Diarrhea, with symptoms lasting more than 2 weeks, was reported in 3% of patients.

## Discussion

Prevalence rates of GI symptoms and signs in studied population increased with age, 97.2% of subjects in the 60-69 year age group. In our previous study on this age group constipation was the most common symptom, 29.1% in diabetic patients with complications and 18.1% in diabetic patients without complications (14). In the current study there is a relationship between constipation, poor controlled diabetes (62.7%), duration of diabetes (74.1%) and the complication of diabetes (71.6%).

Diarrhea lasting longer than 2 weeks had been reported in 3% patients, in comparison with a much lower prevalence in the general population (0.4%) (14). Another study reported diarrheal symptoms had a prevalence of 3% in complicated diabetic patients and 1.9% in non complicated diabetic patient (15). This study also reported a relationship between diarrhea more than 2 weeks and uncontrolled diabetes mellitus ( $p=0.001$ ).

The prevalence of heartburn in our study was 25.5%, but this prevalence was 3% in general population. Reflux in our previous study reported 8.3% in diabetic patients without any complications and 18.9% in complicated diabetic patients, and 11.6% in patients with DMI and 22.9% in control group, and 19.8% in patients with DM II (14) and 24.3% (15) in control group and these results were similar to our study. In our study constipation, melaena and mass protruding anus have not been reported in DM I. There was no relationship between

type of diabetes and abdominal pain, dyspepsia, diarrhea more than 2 weeks, bloating, and heartburn. Abdominal hernia had been reported in 7% of patients, in compare to general population 0.5% (14). Seventy five percent of the abdominal hernias were inguinal hernia and rests were incisional, femoral and umbilical hernias. In our study most patients had incisional and umbilical hernias.

The limitation of this study is we investigated the single clinic population and no control group was recruited from a general non-diabetic population. Therefore, we suggest that further studies with matched control group may be of interest.

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