



Original Article

Constipation prevalence in diabetic patients[☆]

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ABSTRACT

Objective: the aim of this study was to identify the prevalence of constipation in diabetic patients treated at the endocrinology outpatient clinic at Hospital Universitário Professor Alberto Antunes and PAM Salgadinho, from April to August 2013.

Methods: a descriptive and cross-sectional study, carried out through a questionnaire using the Rome III criteria in 372 patients treated at the outpatient endocrinology clinic.

Results: of 372 patients evaluated, the frequency of constipation found was 31.2% among diabetic patients. Females predominated in the sample (72.8%) as well as for the frequency of constipation (80.2%). The incidence of type II diabetes was 97.3% and it was observed that 80.2% of the sample was older than 50 years. One hundred and twelve patients with inadequate glycemic control ($HgA1c \geq 7$) had an association with constipation.

Conclusion: there was an increased frequency of constipation in patients with diabetes mellitus according to the Rome III criteria, in relation to the general population. The inadequate glycemic control in patients with diabetes mellitus increases the frequency of constipation and it is necessary to perform studies that allow the confirmation of this association to demonstrate this hypothesis.

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Frequência da constipação intestinal em pacientes diabéticos

RESUMO

Objetivo: analisar a prevalência da constipação intestinal em pacientes diabéticos atendidos no ambulatório de endocrinologia do Hospital Universitário Professor Alberto Antunes e no PAM Salgadinho (HUPAA), de abril de 2013 a agosto 2013.

Palavras-chave:

Constipação intestinal

Diabetes mellitus

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Hemoglobina glicada
Critérios de Roma III

Método: estudo descritivo e transversal, realizado através da aplicação de um questionário com os critérios de Roma III no ambulatório de endocrinologia do HUPAA.

Resultado: em 372 pacientes, 271 feminino, 101 masculino, 162 de etnia branca, 55 negros e 155 pardos, 297 pacientes estavam acima de 50 anos, houve uma frequência de constipação de 31,2% nos pacientes diabéticos. O gênero feminino prevaleceu na amostra (73%) assim como no índice de frequência da constipação (80,2%). Em nossa amostra a diabetes Tipo II foi verificada em 360 pacientes (97%) e o tipo 1 em 12 pacientes (3%), observou-se que 80% da amostra apresentavam idade superior a 50 anos. Em 112 pacientes com controle glicêmico inadequado ($HgA1c \geq 7$) havia uma associação com a constipação intestinal.

Conclusão: encontramos maior frequência da constipação intestinal em pacientes com Diabetes Mellitus, segundo os critérios de Roma III, em relação à população geral. Há uma associação entre o controle glicêmico inadequado nos pacientes com Diabetes Mellitus e a frequência da constipação, faz-se necessário a realização de outros estudos que possibilitem confirmar a associação dessa variável para comprovação desta hipótese.

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Introduction

Currently, one of the major public health problems worldwide is Diabetes Mellitus (DM), as it is a disease with high prevalence. It is estimated that approximately 173 million individuals are affected by this disease, with a predicted prevalence of 300 million in 2030. In Brazil, a prevalence of 8 million individuals with diabetes was estimated in 2005.¹

Diabetes mellitus is a chronic metabolic syndrome, of multiple etiology, caused by the incapacity of the pancreas to secrete insulin (type I DM) or by the incapacity of the hormone to act appropriately on its peripheral receptors (type II DM), both narrowing to a state of hyperglycemia.^{1,2}

It is related to complications that reduce productivity and undermine the quality of life and survival of patients and because of its chronic nature, it requires constant care due to complications inherent to the disease making it very costly to health services.³

Several gastrointestinal symptoms are often observed in patients with DM.⁴ Among the gastrointestinal dysfunctions found in diabetics, constipation is the most frequent one.⁵

The proposal that the intestinal motility disorders are caused by impairment of the autonomic nervous system, as part of diabetic neuropathy, is due to similarities that occur between gastrointestinal symptoms after vagotomy and sympathectomy, and those that are commonly observed in patients with long-term DM.^{6,7}

Constipation was defined according to the Rome III Criteria, internationally standardized at a meeting held in Rome in 1999.⁸

Objective

To analyze the frequency of constipation in diabetic patients treated at the Endocrinology Outpatient Clinic of Hospital

Universitário Professor Alberto Antunes and PAM Salgadinho, from January to July 2013.

Material and methods

This is a descriptive, cross-sectional study, submitted and approved by the Research Ethics Committee (protocol # 1569). This study was based on a questionnaire applied to patients attending the Endocrinology Outpatient Clinic, containing some demographic data (gender, ethnicity, age). Constipation was defined through the Rome III criteria, which are: (1) fewer than three bowel movements a week, (2) effort to evacuate, (3) presence of hard or lumpy stools, (4) sensation of incomplete evacuation, (5) sensation of obstruction or interruption of evacuation, and (6) manual maneuvers to facilitate defecation. A total of 372 patients were evaluated, of which 271 were females, 101 males, 162 whites, 55 blacks and 155 biracial; 297 patients were aged between 50 and 65 years and 75 patients were aged 15 to 49 years.

More than two of these items for at least six months are needed for the diagnosis and definition of constipation according to the Rome III criteria, confirming that evacuations are rare without the use of laxatives and excluding the diagnosis of irritable bowel syndrome.⁸

Data related to the DM were also evaluated, such as glycated hemoglobin levels, to verify the possible influence of glycemic control on the development of constipation. Although there are diverse causes of constipation, we tried to reduce the confounding biases by using some exclusion criteria: pregnant patients, previous history of gastrointestinal diseases, surgeries involving the digestive tract, psychiatric disorders, which are conditions known to affect the enteric physiology. The study was carried out at the Endocrinology Outpatient Clinic of Hospital Universitário Professor Alberto Antunes and PAM – Salgadinho from April to August 2013 and the data were stored and analyzed in an electronic spreadsheet (Microsoft Excel 2007/2010®).

Table 1 – Frequency of type I and II Diabetes in patients treated at the Endocrinology Outpatient Clinic, Hospital Universitário Professor Alberto Antunes and PAM Salgado (Health Secretariat) in the period January to July 2013, Alagoas/Brazil.

	n	%
Diabetes type I	10	2.7%
Diabetes type II	362	97.3%
Total	372	100%

Results

Among the three hundred seventy-two diabetic patients assessed (Table 1), 116 (31.2%) were constipated. The female gender predominated in the sample (72.8%), associated with a higher frequency of constipation (80.2%) (Table 2). The mean of Type II Diabetes was 97.3% and it was observed that 80.2% of patients were older than 50 years. In 112 patients with inadequate glycemic control ($HgA1c \geq 7$), DM was associated with constipation.

Discussion

The frequency of intestinal constipation was higher in diabetic patients than in the general population. We observed that patients who had glycated hemoglobin (HbA1c) measured and whose HbA1c levels were >7 showed a greater association with constipation than diabetic patients with HbA1c values within the normal range. The questionnaire used in the study confirmed that the age group between 50 and 65 years and the female gender predominated.

Maxton et al. analyzed 200 patients and found that constipation was more common in those with autonomic neuropathy than in those who had no such disorder or in healthy controls. In this study, constipation was observed in 22% of diabetics with autonomic neuropathy, being significantly more common than in diabetic patients without neuropathy. However, no increase was observed in the number of constipated individuals among diabetic patients with normal autonomic system, when compared with their control group.⁹

Recently it has been suggested that glycemic control dramatically alters gastrointestinal functions, such as gastric emptying,¹⁰ myoelectric activity⁴ and the colonic response to feeding.¹¹ Several studies have shown a delay in gastric emptying in both normal individuals and diabetic patients

during hyperglycemia. According to Dao et al., the threshold for the delay in gastric emptying due to hyperglycemia may be greater in patients with type II diabetes. In healthy individuals and patients with type I diabetes, hyperglycemia accelerates gastric emptying for liquids and solids. This observation was interpreted as a physiological counter-regulation to hypoglycemia.¹² Sims et al. demonstrated the impaired gastrocolonic responses and colonic peristaltic reflex in healthy individuals when submitted to hyperglycemic conditions.^{13,14}

The electrolyte imbalance caused by diabetic ketoacidosis and uremia may further worsen motor function in diabetic patients.¹⁵ While the effects of advanced diabetes are frequently observed on gastrointestinal motor function, this process has not yet received an adequate explanation for the occurrence of symptoms in many patients.³

Some gastrointestinal disorders are common in individuals without diabetes mellitus and have been closely related to psychiatric disorders. In fact, a study carried out in diabetic U.S. patients showed that symptoms suggestive of diseases in the proximal digestive tract, as well as changes in bowel habits, were more significantly associated with psychiatric disorders than with the presence of peripheral neuropathy, thus suggesting that the complaints related to the gastrointestinal tract in diabetics may correspond to non-organic functional syndromes, so common in the general population.⁹

Clouse et al. carried out a study with a sample of 114 patients with type I and II DM, taking into account whether the observed gastrointestinal symptoms were due to diabetic neuropathy or psychiatric disorders. The presence of neuropathy was established using conduction studies of peripheral nerves and objective tests of autonomic function. The established psychiatric disorders of anxiety and depression were well characterized through previous interviews with specialists. It was observed, after analysis, that the diabetic group who reported symptoms of anxiety and depression and had no motility disorders had more severe gastrointestinal symptoms, thus suggesting that the diabetic neuropathies very often would not be the main symptom determinant.¹⁶

Janatuinen et al. carried out an investigative study using questionnaires aimed at verifying the occurrence of gastrointestinal symptoms in middle-aged patients, 45–64 years. A total of 89 insulin-dependent and 481 non-insulin dependent patients were analyzed with a control group of 635 patients. The prevalence of gastrointestinal symptoms such as abdominal pain, diarrhea and constipation were similar to that of the control group. The non-insulin dependent women had a higher incidence of gallstones than insulin-dependent ones and the control group, 29%, 5% and 19%, respectively. Therefore, they concluded that the spectrum and occurrence of gastrointestinal symptoms did not differ from those found in the general population.¹⁷

In our series of 372 diabetic patients, 271 (72.8%) females and 101 (27.2%) males, we found a prevalence of 116 (31.2%) constipated and 256 (68.8%) non-constipated patients, with a predominance of constipation in patients older than 50 years. Regarding glycemic control of the 112 patients evaluated, 42 (37.5%) had constipation. Of these, 35 (83.3%) had poor glycemic control. Our result of 31.2% of constipation is higher than those found in the literature. We demonstrated a correlation between poor glycemic control and prevalence

Table 2 – Frequency of constipated patients for each gender. Patients treated at the Endocrinology Outpatient Clinic of Hospital Universitário Professor Alberto Antunes and PAM Salgado (Health Secretariat) in the period April to August 2013 Alagoas/Brazil.

	n	%
Female constipated	93	80.2%
Male constipated	23	19.8%
Total	116	80.2%

of constipation, suggesting that this laboratory finding can directly influence the emergence of this symptom.

Although gastrointestinal disorders are frequent in diabetic patients, the pathogenesis of gastrointestinal motility has not been fully elucidated or understood, and thus, further studies are needed to demonstrate this hypothesis; it is known, however, that this is a multifactorial disease, and other prospective, randomized studies are necessary so that we can issue a more significant opinion on such a controversial subject.

Conclusions

We found a higher frequency of constipation in patients with diabetes mellitus, according to the Rome III criteria, when compared to the general population. Inadequate glycemic control in diabetes mellitus significantly increases the frequency of constipation. Further studies are necessary to allow an association with this variable and demonstrate this hypothesis.

Conflicts of interest

The authors declare no conflicts of interest.

REFERENCES

- Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de diabetes 2009/Sociedade Brasileira de Diabetes. 3 edição Itapevi. SP: A Araújo, Silva Farmacêutica; 2009.
- Camilleri M. Gastrointestinal problems in diabetes. *Endocrinol Metab Clin North Am.* 1996;25:361-78.
- Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J. Harrison's principal of internal medicine. 18^a Edition McGraw-Hill; 2011.
- Forgacs I, Patel V. Diabetes and the gastrointestinal tract. Elsevier Ltd.; 2011. Artigo 2.
- Naohiko U, Akio I, Yoshiko S. The effect of mosapride citrate on constipation in patients with diabetes. *Diabetes Res Clin Pract.* 2010;87:27-32. ARTIGO 5.
- Feldman M, Lawrence S, Schiller R. Disorders of gastrointestinal motility Associated with Diabetes mellitus. *Ann Int Med.* 1983:378-84.
- Duchen LW, Anjorin A, Watkins PJ, Mackay JD. Pathology of autonomic neuropathy in diabetes mellitus. *Ann Intern Med.* 1980;92.
- Appendix A. Rome III Diagnostic Criteria for FGIDs.
- Maxton DG, Whorwell PJ. Functional bowel symptoms in diabetes – the role of autonomic neuropathy. *Postgrad Med J.* 1991;67:991-3.
- Folwaczny C, Riepl R, Landgraf R. Gastrointestinal involvement in patients with diabetes mellitus: Part I. Epidemiology, pathophysiology, clinical finds. *Z Gastroenterol.* 1999.
- Fraser RJ, Horowitz M, Maddox AF, et al. Hyperglycemia shows gastric emptying in type I (insulin-dependent) diabetes mellitus. *Diabetologia.* 1989;32:151-9.
- Dao T, Chee B, Bouvar G, et al. Lack of modulation of gastric emptying by acute hyperglycemia in Type 2 diabetes mellitus. *Gastroenterology.* 1990;38:79-85.
- Sims MA, Hasler WL, Chey WD, et al. Acute hyperglycemia inhibits gastrocolonic and colonic peristaltic reflexes measured by electronic barostat in healthy humans. *Gastroenterology.* 1994;106:A566 [Abstract].
- Sims MA, Hasler WL, Chey WD, et al. Hyperglycemia inhibits mechanoreceptor-mediated gastrocolonic responses and colonic peristaltic reflexes in healthy humans. *Gastroenterology.* 1995;108:350-9.
- Jebbink RJA, Samson M, Bruijs PPM, et al. Hyperglycemia induces abnormalities of gastric myoelectrical activity in patients with diabetes mellitus. *Gastroenterology.* 1994;107:1390-7.
- Clouse RE, Lustman PJ. Gastrointestinal symptoms in diabetic patients: lack of association with neuropathy. *Am J Gastroenterol.* 1989;84:868-72.
- Janatuinen E, Pikkaraunen P, Laakso M, Pyorala K. Gastrointestinal symptoms in middle-aged patients. *Scand J Gastroenterol.* 1993;28:427-32.