ORIGINAL ARTICLE

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Clinical study of the oral manifestations and related factors in type 2 diabetics patients

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Abstract

Diabetes Mellitus (DM) is reported with and associated to oral alterations, with conflicting results. The aim of this study was to identify the prevalence of oral soft tissue alterations in type 2 diabetes mellitus patients.

Material and Methods: Socioeconomic variables, gender, heredity, capillary glucose control and local factors (prosthesis, dry mouth sensation) were analyzed in 196 diabetic and non-diabetic patients enrolled in HIPERDIA, at 41 Health Units of Natal, Brazil.

Study Design: A case study.

Results: The last blood glucose mean was 177.0 mg/dl for diabetics and 89.46 mg/dl for non-diabetics. Mean capillary blood glucose was elevated in diabetics (215.95 mg/dl); it was 102.31 mg/dl in non-diabetics. The family history confirmed the heredity nature of the disease in 68.8% of diabetic patients (n = 66) ($p < 0.001$); salivary flow was 49% (n = 47) in diabetics, and 34% (n = 34) in non-diabetics. Candidiasis was present in 30.5% of diabetic patients (n=29) and 36% of non-diabetics (n=36). Both groups had lesions in the palate - 81.4% (n = 35) in diabetics, and 71.1% in non-diabetics (n = 27) ($p = 0.68$).

Conclusion: The alterations are not related to diabetes and are present independently of having or not type 2 Diabetes Mellitus.

INTRODUCTION

Diabetes mellitus (diabetes) is a complex metabolic disease characterized by altered carbohydrate, lipid, and protein metabolism, which results in marked or absolute insulin deficiency - type 1 diabetes - or peripheral tissue insulin resistance - type 2 diabetes. Type 3 is gestational diabetes, where there is carbohydrate intolerance during pregnancy.[1]

A Brazilian multicentre study on the prevalence of diabetes, coordinated by the Ministry o Health,[2] has mapped the disease in this country: the prevalence is 7.6 % in the urban adult population of nine capitals. The study revealed that 46.5 % of diabetics ignored their condition, and 22.3 % had but did not treat the disease.

Faced with an increasing diabetic and hypertensive population, the Ministry of Health, in a partnership with State and Municipal Secretariats, scientific societies (diabetes, cardiology, and nephrology), and associations of diabetic and hypertensive patients, has reorganized healthcare through the Plan for Reorganizing Healthcare for Arterial Hypertension and Diabetes, to reduce the morbidity and mortality of these conditions. The plan improves healthcare for patients with these diseases by health-promoting actions involving preventive, curative and control measures.[3]

Several systemic diseases manifest in the mouth, including diabetes. Absence of metabolic control appears to alter the susceptibility of patients with diabetes to periodontal disease, fungal infections, and changes in taste. The relationship between diabetes and oral lichen planus and dental caries is less obvious; several studies have shown widely diverging results.[4-7]

A few studies have suggested that decrease salivary flow results from the use of certain drugs, which would result in changes within the mouth, leading to caries, periodontal disease, and soft tissue alterations; the latter may foster invasion by opportunistic microorganisms. Several types of drugs may cause a subjective feeling of dry mouth, or may induce low salivary flow; these include anticholinergics, antidepressants, diuretics, antihistamines, myorelaxants, diazepinic drugs, and sympatheticomimetics such as hypotensive drugs.[8,9] This last category is commonly used by diabetics who also have arterial hypertension as a comorbidity.

On the other hand, there are published reports of salivary gland disorders as a systemic consequence of diabetes affecting the parenchyma of salivary glands, resulting in altered salivary gland function. Histological alterations in these glands change the shape and function of acinar cells, resulting in decreased enzyme activity because of degenerative complications of diabetic angiopathy, neuropathy, and hormone changes following metabolic derangement.[10,11] Murrah[12] described the oral signs of diabetes as follows: xerostomy, angular cheilitis, decreased salivary flow, increased glucose levels in saliva produced by the parotid gland as a results of elevated blood glucose.

The scientific community has not reached any conclusion about the relation between use of dentures and oral alterations in diabetic patients. Several conflicting studies have been published on dentures as risk factors for stomatitis and candidiasis in diabetic[13-15] and non-diabetic[16,17] patients.

The purpose of this study was to check which oral soft tissue manifestations were found in type 2 diabetes, and the correlation between these findings and this complex disease.

MATERIALS AND METHODS

A observational individualized cross-sectional study was made from December 2007 to December 2008. The sample comprised 196 diabetic and non-diabetic patients. The sample size was calculated based on a 35 % prevalence of outcomes (oral alterations), a 20 % margin of error, and a 20 % non-response rate. The confidence level was 95 % (a=0.05).[18]

From an initial calculated sample of 220 patients, 10 % (20 persons) did not present, and 1.8 % (4 persons) decided voluntarily not to participate. Thus, the final sample consisted of 196 patients, of which 96 were diabetic and 100 were non-diabetic.

The inclusion criteria were patients of both sexes aged 40 years or over, diagnosed with type 2 diabetes, and non-diabetics of both sexes and the same age group. The exclusion criteria were patients with type 1 diabetes and subjects aged less than 40 years.

A questionnaire was applied to gather data on the clinical history, the social and economic profile,[19] and the dental history. A glucometer (Accucheck Roche) was used to measure glucose levels (capillary glucose), which was dichotomized as follows: postprandial values ≤ 140mg/dL - controlled glucose levels; and postprandial values ≥ 140mg/dL - uncontrolled glucose levels.[20,21] Arterial blood pressure was also measured. Two observers carried out the physical examination, which consisted of noting the status of the lips, the jugal mucosa, the tongue, the floor of the mouth, the hard and soft palates, and use of dentures. A World Health Organization (WHO) form for epidemiological studies was used.[22] Diagnosis of different types of candidiasis was based on the clinical signs (Neville et al.).[23] A similar procedure was adopted for the medical diagnosis of oral lichen planus, noting the presence of Wickham striae to characterize reticular lichen planus,[23] the clinical type encountered in the sample, as well as aphthous ulcers characterized by lesions covered with white-yellowish membranes surrounded by an erythematous halo.[23] We excluded non-pathologic or developmental alterations such as Fordyce granules, lingual varices, benign migratory glossitis, and fissured tongue.[23]