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ORIGINAL ARTICLE

Otologic and audiologic characteristics of type 2 diabetics in a tertiary health institution in Nigeria☆

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KEYWORDS
Diabetes mellitus;
Ear disease;
Hearing impairment;
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Abstract
Introduction: This cross-sectional comparative study was carried out at the Diabetes outpatient clinic of LAUTECH Teaching Hospital (LTH) Ogbomoso, Nigeria.
Objective: This study assessed patterns of otologic diseases and auditory acuity among type 2 diabetics and determinants of these findings among diabetics.
Methods: Ninety-seven consenting patients with clinical diagnosis of diabetes mellitus (194 ears) were matched for age and sex with ninety non-diabetic patients (180 ears). These patients were screened using otoscopy and pure tone audiometry over a 6-month period.
Results: The study reported a crude prevalence rate of 21.6% hearing loss in T2DM patients. The most common type of otologic disease that showed significant association with T2DM patients was otitis media with effusion ($p = 0.027$). T2DM was significantly associated with abnormal audiometric findings ($p = 0.022$), particularly sensorineural hearing loss ($p = 0.022$), of the moderate grade ($p = 0.057$). There were no differences of the audilogical findings for any particular ear, and no differential affectation of frequency range was observed. Coexisting hypertension and poor glycaemic control were significantly associated with aggravation of the hearing of the T2DM patients ($p < 0.001$, and $p = 0.009$ respectively).

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Conclusion: T2DM had appreciable effects on hearing acuity. T2DM was significantly associated with the type and the degree of the hearing loss. The need for screening of hearing acuity of T2DM patients, in order to detect early changes, and promptly offer an adequate management and remedial measures was emphasized in this study.

PALAVRAS-CHAVE
Diabetes melito;
Doença otológica;
Deficiência auditiva;
Audiometria tonal;
Nigéria

Características audiológicas e otológicas de diabéticos tipo 2 em uma instituição de saúde terciária na Nigéria

Resumo
Introdução: Este estudo de caso-controle foi realizado no Ambulatório de Diabetes do *LAUTECH Teaching Hospital* (LTH), em Ogbomoso, Nigéria.
Objetivo: Este estudo avaliou os padrões de doenças otológicas e acuidade auditiva entre os diabéticos tipo 2 e os fatores determinantes desses achados entre os diabéticos.
Método: Ao todo, 97 pacientes com diagnóstico clínico de diabetes melito (194 orelhas) deram seu consentimento e foram pareados por idade e sexo, com 90 pacientes não diabéticos (180 orelhas). Eles foram avaliados por otoscopia e audiometria tonal liminar por um período de seis meses.
Resultados: O estudo relatou uma taxa de prevalência bruta de 21,6% de perda auditiva em pacientes com DM2. O tipo mais comum de doença otológica, afetando significativamente pacientes com DM2, foi otite média com efusão ($p = 0,027$). A DM2 foi associada com achados audiométricos alterados ($p = 0,022$), principalmente perda auditiva neurossensorial ($p = 0,012$), de grau moderado ($p = 0,057$). Não houve predileção dos efeitos da DM2 para uma das orelhas em particular, e também não houve efeito diferencial da faixa de frequência. A coexistência de hipertensão e controle glicêmico inadequado associou-se significativamente à piora da audição dos pacientes com DM2 ($p < 0,001$ e $p = 0,009$, respectivamente).
Conclusão: A DM2 mostrou apresentar efeitos significantes na acuidade auditiva afetando significativamente o tipo e o grau da disacusia. Este estudo mostrou a necessidade de avaliação da acuidade auditiva de pacientes com DM2, a fim de detectar as alterações iniciais, e poder rapidamente oferecer medidas corretivas adequadas.

Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia due to inadequate insulin secretion, ineffective action or a combination of these. Worldwide, the prevalence of diabetes is increasing although the rate varies from countries, races and religion. It has been estimated that the prevalence of diabetes will increase from present 382 million to 592 million by 2035.[1] The vast majority of diabetes cases fall into 2 major etiopathogenetic categories, Type 1 diabetes which occurs as a result of absolute deficiency of insulin secretion and Type 2 diabetes which is caused by a combination of insulin resistance and a faulty compensatory insulin secretory response.[2] Other categories include; Other specific types (caused by specific genetic defects, surgery, drugs); Gestational Diabetes Mellitus (GDM); Impaired Glucose Tolerance (IGT) and Impaired Fasting Glucose (IFG).[2] Type 2 diabetes mellitus (T2DM) accounts for 80%–90% of all cases of diabetes and is closely related to obesity among other risk factors. It is a multisystem disorder with a propensity to affect the cardiovascular system, and produces varying chronic microvascular and macrovascular complications. Amongst the complications, hearing loss remains one of its most-distressing and least understood phenomenon. Thus researchers have proposed various hypotheses including micro-angiopathy and neuropathy to explain the complication.[3–5] Infact, studies have demonstrated that the micro-angiopathy in Type 2 Diabetes Mellitus (T2DM) involves mostly the cochlear with associated degeneration of the stria vascularis and cochlear outer hair cells.[6,7]

The pattern of hearing loss in diabetes has been shown in many studies[8–14] to be moderately severe in magnitude, progressive in nature, and bilateral in occurrence and may be irreversible. The prevalence of hearing loss in diabetics in Nigerian population has not been studied extensively.[9,15] This study was undertaken to describe the pattern of otologic diseases and auditory acuities in T2DM patients comparing this with those of non-diabetics and to also explore the determinants of these patterns. This is