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Relationship between blepharitis and components of the metabolic syndrome☆,☆☆

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ABSTRACT

Objective: To determine the relationship between the components of the metabolic syndrome with the presence of blepharitis.
Methods: The study included 60 patients with a diagnosis of blepharitis and 30 control subjects. Anthropometric measurements and blood pressure were recorded, and peripheral venous blood samples were obtained under fasting conditions to determine the concentration of Glucose, Cholesterol, and Triglycerides. High-density lipoprotein cholesterol (HDL-C) was determined after precipitating lipoproteins containing apoB-100 with phosphotungstic acid/Mg^{2+}. The concentration of low density lipoprotein cholesterol (LDL-C) was calculated using the Friedewald formula modified by DeLong.
Results: In the comparative analysis, statistically significant differences were found in the waist circumference ($p = 0.0491$), systolic blood pressure ($p = 0.0149$), glucose ($p = .0045$), total cholesterol ($p = 0.0001$), HDL-C ($p = 0.0049$), LDL-C ($p = 0.0266$), and triglycerides ($p = 0.0059$); while there was no significant differences in the BMI or the diastolic pressure.
Conclusions: The results support the hypothesis that the metabolic syndrome could be considered a risk factor for the development of blepharitis, and its timely detection is essential to avoid future complications.

Relación entre blefaritis y componentes del síndrome metabólico

Palabras clave:
Blefaritis

RESUMEN

Objetivo: Determinar la relación entre los componentes del síndrome metabólico con la presencia de blefaritis.

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Síndrome metabólico
Dislipidemia
Glándulas de Meibomio

Métodos: Se incluyeron 60 pacientes con diagnóstico de blefaritis y 30 sujetos control. Se realizaron medidas antropométricas, presión sanguínea y se obtuvieron muestras de sangre venosa periférica en condiciones de ayuno para la determinación de concentración de glucosa, colesterol y triglicéridos. El colesterol de las lipoproteínas de alta densidad (c-HDL) se determinó después de precipitar las lipoproteínas que contienen apoB-100 con ácido fosfotúngstico/Mg^{2+}. La concentración de las lipoproteínas de baja densidad (c-LDL) se calculó utilizando la fórmula de Friedewald modificada por DeLong.
Resultados: En el análisis comparativo se encontraron diferencias estadísticamente significativas en la circunferencia de cintura (p = 0,0491), presión arterial sistólica (p = 0,0149), glucosa (p = 0,0045), colesterol total (p = 0,0001), c-HDL (p = 0,0049), c-LDL (p = 0,0266) y triglicéridos (p = 0,0059); mientras que en el IMC y en la presión diastólica no hubo diferencia significativa.
Conclusiones: Los resultados encontrados apoyan la hipótesis de que el síndrome metabólico podría ser considerado un factor de riesgo para el desarrollo de blefaritis y su detección oportuna es fundamental para evitar las complicaciones futuras.

Introduction

According to the American Ophthalmology Academy, blepharitis is a common eyelid inflammation disorder giving rise to irritation, itching, reddening and burning. The causes of blepharitis are not yet known although it has been associated to bacterial infection, *Demodex folliculorum*, dry eye and skin diseases such as rosaceae, among others.[1,2]

Ocular microbiota is important in the development of blepharitis. Bacteria which are normally isolated from the palpebral edges produced lipases, cholesterol esterases and lipopolisacaridases that could alter the composition of lacrimal film lipids. In turn, these changes predispose towards the local proliferation of opportunistic bacteria.[2,3] Diabetic patients could exhibit increased risk for opportunistic colonization of their eyelids, enabling the development of blepharitis and compromising the lacrimal film lipidic layer with increased evaporation of tears, diminished breakup time and increased osmolarity. The latter damages the ocular surface, facilitating faster tear evaporation and perpetuating gland dysfunction, thus closing the vicious circle of increased risk for blepharitis in diabetic patients.[4–6]

In what concerns dyslipidemia as a risk factor, lacrimal film stability is influenced by its lipidic composition, not only the fatty acid type but also the relative amount of cholesterol esters.[7,8] An increase in the thickness of the lipidic portion of the tear could entail higher risk of blepharitis. One of the functions of the lipidic layer of the tear is to preserve a clear optical surface and to form a barrier protecting the eye from microbial agents and organic matter such as dust.[9] When the lipidic layer in tears undergoes changes in its composition, it is to be expected that its function will be altered and its antimicrobial capacity to diminish, thus increasing the risk of infection and blepharitis.[9,10]

At present, available information that relates the metabolic syndrome with the presence of blepharitis is scarce as the literature tends to focus exclusively on the dysfunction of Meibomian glands in patients with diabetes mellitus.[11,12] There are no studies associating levels of glucose, arterial pressure, lipid concentrations and other metabolic syndrome variables with the presence of blepharitis. Ocular diseases related to metabolic syndrome include diabetic retinopathy, cataracts and glaucoma.[13,14] In 2016, Serefoglu et al. reported alterations in the Schirmer test in patients with metabolic syndrome despite unchanged lacrimal osmolarity.[15] The objective of the present study was to determine the relationship between metabolic syndrome components and the presence of blepharitis.

Material and methods

A prospective, transversal, descriptive and comparative study conducted with patients diagnosed with blepharitis who visited the ophthalmological specialty Dept. The study included 60 patients with blepharitis diagnostic that agreed to participate. They were selected consecutively and the study included 30 control subjects. The control group was taken from the population that visited the hospital accompanying patients and who, after an ophthalmological checkup, were found to be free of blepharitis. All participants signed an informed consent document and the study was accepted by the Research Committee and the Ethics in Research Committee. Anthropometric measurements were taken, as well as blood pressure, and peripheral venous fasting blood samples without anticoagulant. To determine the concentration of glucose, cholesterol and triglycerides, colorimetric enzymatic methods were utilized. Cholesterol of high density lipoproteins (c-HDL) was assessed after precipitating lipoprotein containing apoB-100 with phosphotungstic acid/Mg^{2+}. Concentration of low density lipoproteins (c-LDL) was calculated utilizing the Friedewald formula as modified by DeLong et al.[16] The Spin 120 equipment was utilized.

Data were analyzed utilizing the GraphPad Prism v.5 application with t-tests taking into account parametric and nonparametric values. A $p < 0.05$ value was taken as statistically significant.