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ORIGINAL ARTICLE

Skin Disorders in Overweight and Obese Patients and Their Relationship With Insulin[☆]



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KEYWORDS

Obesity;
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Abstract

Introduction: The prevalence of obesity has increased worldwide in recent years. Some authors have described skin conditions associated with obesity, but there is little evidence on the association between insulin levels and such disorders.

Objective: To describe the skin disorders present in overweight and obese patients and analyze their association with insulin levels.

Material and methods: The study included nondiabetic male and female patients over 6 years of age who were seen at our hospital between January and April 2011. All the patients were evaluated by a dermatologist, who performed a physical examination, including anthropometry, and reviewed their medical history and medication record; fasting blood glucose and insulin were also measured. The patients were grouped according to degree of overweight or obesity and the data were compared using analysis of variance or the χ^2 test depending on the type of variable. The independence of the associations was assessed using regression analysis.

Results: In total, 109 patients (95 adults and 13 children, 83.5% female) were studied. The mean (SD) age was 38 (14) years and the mean body mass index was 39.6 ± 8 kg/m². The skin conditions observed were acanthosis nigricans (AN) (in 97% of patients), skin tags (77%), keratosis pilaris (42%), and plantar hyperkeratosis (38%). Statistically significant associations were found between degree of obesity and AN ($P = .003$), skin tags ($P = .001$), and plantar hyperkeratosis. Number of skin tags, AN neck severity score, and AN distribution were significantly and independently associated with insulin levels.

Conclusions: AN and skin tags should be considered clinical markers of hyperinsulinemia in nondiabetic, obese patients.

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PALABRAS CLAVE

Obesidad;
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fibromas

Dermatosis en pacientes con sobrepeso y obesidad y su relación con la insulina**Resumen**

Introducción: La prevalencia de obesidad se ha incrementado mundialmente en los últimos años. Existen estudios que describen las dermatosis que se asocian con la obesidad; sin embargo, existe poca evidencia de su asociación con los niveles de insulina.

Objetivo: Describir las dermatosis presentes en pacientes con sobrepeso y obesidad y su asociación con los niveles de insulina.

Material y métodos: Se incluyeron pacientes de ambos sexos, mayores de 6 años, no diabéticos que acudieron a la consulta durante los meses de enero a abril de 2011. Todos los sujetos fueron valorados por un dermatólogo, se realizó exploración física, antropometría, historia médica, medicamentos y medición de glucosa e insulina de ayuno. Los pacientes se dividieron de acuerdo a sobrepeso y grado de obesidad y se compararon con Anova o Chi cuadrado, dependiendo del tipo de variable. Se realizó análisis de regresión para evaluar la independencia de las asociaciones.

Resultados: Fueron incluidos 109 pacientes (95 adultos y 13 niños; 83,5% mujeres), con edad media de 38 ± 14 años y un índice de masa corporal de $39,6 \pm 8$ kg/m². Las dermatosis encontradas fueron: acantosis nigricans (97%), fibromas (77%), queratosis pilar (42%) e hiperqueratosis plantar (38%). Las que se asociaron de forma estadísticamente significativa con el grado de obesidad fueron acantosis nigricans ($p=0,003$), fibromas ($p=0,001$) e hiperqueratosis plantar. El grado de acantosis nigricans en el cuello, su topografía y el número de fibromas mostraron asociación significativa e independiente con los niveles de insulina.

Conclusiones: La acantosis y los fibromas deberían considerarse marcadores clínicos de hiperinsulinemia en población obesa y no diabética.

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Introduction

The last 3 decades have seen an unprecedented increase in the prevalence of obesity throughout the world.¹ In the United States of America, the prevalence of obesity is 35.5% in men, 35.8% in women,² and 17% in children aged 2 to 19 years.³ In Mexico, the 2012 National Health Survey reported that the prevalence of obesity (body mass index [BMI] ≥ 30 kg/m²) in adults was 32.4% and the prevalence of overweight was 38.8% and that this prevalence was higher in women (37.5%) than in men (26.8%). The combined prevalence of overweight and obesity is only 3.6 percentage points greater in women (73.0%) than in men (69.4%); the combined prevalence for adolescents and adolescent males was 35.8% and 34.1%, respectively.⁴ Although obesity is considered a public health problem, it was recently recognized that rapid multidisciplinary action is necessary to ensure better prevention, timely diagnosis, and control.^{5,6} Obesity is accompanied by comorbid conditions such as hypertension, type 2 diabetes mellitus, cardiovascular disease, polycystic ovary syndrome, obstructive sleep apnea syndrome, breast and colorectal cancer, psychological and orthopedic problems, and skin disorders.⁷

Dermatologic manifestations associated with obesity are common^{8,9} and have been classified according to their pathophysiologic origin as being associated with insulin resistance (IR), hyperandrogenism, skin folds, mechanical causes, and hospitalization.^{10,11} Several publications have shown the association between IR and acanthosis nigricans (AN) and skin tags both in adults¹² and in children.^{13,14} The objectives of the present study were to identify skin disorders associated with obesity and to evaluate the correlation

between insulin concentrations and skin disorders in nondiabetic overweight or obese individuals.

Materials and Methods

We performed an analytical cross-sectional study including patients aged >6 years (patients aged >18 years were considered adults) of both sexes who attended the Obesity Clinic (bariatric surgery) and the Nutrition Clinic of Hospital General Dr. Manuel Gea González, Mexico City, Mexico from January to April 2011. All patients included in the study signed the informed consent document. All patients who were invited to participate agreed to do so. The Obesity Clinic handles patients who are candidates for bariatric surgery (BMI >40 kg/m² or >35 kg/m² accompanied by a comorbid condition). The Nutrition Clinic handles overweight and obese patients referred from other hospital departments. Patients with diabetes mellitus, pregnant women, and patients taking corticosteroids for more than 3 weeks were excluded, since each of these clinical conditions can be accompanied by specific skin disorders. Patients underwent a physical examination, and their clinical history was taken, with emphasis on previous diseases and anthropometric data (weight, height, waist circumference, and hip circumference). The skin examination aimed to identify lesions associated with hyperinsulinemia, namely, presence and degree of AN on the neck, AN at other sites, and presence and number of skin tags. The examination also included skin disorders associated with hyperandrogenism (acne, hirsutism, and androgenic alopecia), skin folds (intertrigo and bacterial complications), and mechanical causes

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