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ORIGINAL ARTICLE

Anthropometric variations and low resting energy expenditure as a cause of metabolic risk in adult patients with Turner syndrome

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KEYWORDS
Turner syndrome;
Resting energy expenditure;
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Abstract There is currently little evidence available about the metabolic behaviour in adult patients with Turner syndrome (TS). Metabolic complications are common in adult TS patients, increasing morbidity and impairing quality of life. Body composition is altered in TS, secondary to the short stature. Metabolic damage in patients with TS is an important medical issue due to complications observed in adulthood.
Aim: Study some of the aspects involved in the origin of the metabolic damage.
Methods: We conducted an observational, cross-sectional, comparative, descriptive study in 20 adult patients with TS and 20 control patients matched by age, waist circumference, waist circumference/height ratio (W/Hr) as sensitive parameters for metabolic risk. Anthropometric, body composition, resting energy expenditure data and blood samples for blood chemistry, lipid and thyroid profile were considered. Multivariate analysis of variance and the Student's *T*-test were used to analyse the data all the patients' data were corrected according to the predicted specific formula for adult TS.
Results: Statistically significant differences in energy expenditure (REE) modifications and in free fat mass per weight percentage were observed.

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Conclusion: Differences in anthropometric values and REE in TS could be implicated in the metabolic damage, and are attributable to the syndrome and not to the body composition.

PALABRAS CLAVE
Síndrome de Turner;
Gasto energético en reposo;
Obesidad;
Daño metabólico

Variaciones antropométricas y un gasto reducido de energía en reposo, participantes del riesgo metabólico en adultos con síndrome de Turner

Resumen En la actualidad existe poca evidencia disponible sobre el comportamiento metabólico en pacientes adultos con síndrome de Turner (ST). Las complicaciones metabólicas son comunes en pacientes adultos con ST, incrementando la morbilidad y deteriorando la calidad de vida. La composición corporal es alterada en ST, secundario a la baja estatura. El daño metabólico en pacientes con ST es un importante problema médico debido a las complicaciones observadas en la edad adulta.
Objetivo: Estudiar algunos de los aspectos que intervienen en el origen del daño metabólico.
Métodos: Se realizó un estudio observacional, transversal, comparativo y descriptivo en 20 pacientes adultos con ST y 20 pacientes control emparejados por edad, circunferencia de cintura y relación de la circunferencia de cintura/altura (W/Hr) como parámetros sensibles para el riesgo metabólico. Datos de antropometría, composición corporal y el gasto de energía en descanso, así como muestras para la química sanguínea y los perfiles de lípidos y tiroideo fueron considerados. Se utilizó el análisis multivariado de varianza y la prueba T-Student para analizar los datos de todos los pacientes. Los valores fueron corregidos de acuerdo con la fórmula específica prevista para el adulto con ST.
Resultados: Se observaron diferencias estadísticamente significativas en el gasto de energía en reposo (REE) y en la masa libre de grasa por porcentaje de peso.
Conclusión: Las diferencias en los valores antropométricos y REE en ST podrían estar implicados en el daño metabólico y son atribuibles al síndrome y no a la composición corporal.

Introduction

Turner syndrome (TS) is one of the most common sexual chromosomal abnormalities, affecting 1/2500 live female birth, and approximately 1.5 million women around the world have TS.[1] It is associated with threefold increased mortality and a decrease in life expectancy by 13 years.[2] TS is characterised by total or partial monosomy of the second sex chromosome, short stature, skeletal abnormalities and gonadal dysgenesis observed with a lack of oestrogens throughout life. The most common systemic complications are heart and renal defects,[3] endocrine autoimmune diseases, including mainly hypothyroidism,[4] osteoporosis,[5] and metabolic syndrome in adulthood.[6] When the syndrome is diagnosed in childhood there is close medical supervision; however, in adulthood close surveillance by a multidisciplinary group decreases, despite a high rate of complications. Metabolic complications are common in adult TS patients, increasing morbidity and impairing quality of life.[7] Women with TS in adulthood are at high risk for hyperlipidaemia, ischaemic heart disease, atherosclerosis, hypertension, and insulin resistance.[8,9] Type 2 diabetes mellitus (DM) is 2–4 times as common in women with TS compared with the general population and occurs at younger ages.[2,10] Patients with TS are more likely to be overweight and obese. Body composition is altered in TS, secondary to the short stature; Turner females are primarily growth-retarded along the longitudinal axis. Approximately 3–4 SDS compared with a reference population reduces height, sitting height, and arm-span. The hands and feet are reduced in size to a lesser extent, while head circumference, biacromial diameter, and bi-iliac diameter are comparable to those of healthy women.[8–11] Fat mass (FM) and body mass index (BMI) are higher in adult Turner patients compared with age-matched controls, and lean body mass (LBM) is low.[11] In addition, distinct differences in regional body composition are present in young TS girls (9–15 years) in comparison with age and BMI-matched controls, and in adults excess visceral fat and hepatic adipose tissue have been documented.[12] The metabolic damage in patients with TS is an important medical issue due to complications observed in adulthood. There are not many studies in adult TS females. The aim of the present manuscript is study some of the aspects involved in the origin of the metabolic damage, a detailed analysis of body composition and resting energy expenditure (REE) was conducted in a group of adult patients with TS. This study will help in early intervention for TS patients, give some tools for the nutritional management in order to decrease

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