

ORIGINAL ARTICLE

Physical performance and muscle strength in older patients with and without diabetes from a public hospital in Lima, Peru[☆]



Milenka Palacios-Chávez^a, Christine Dejo-Seminario^{a,*}, Percy Mayta-Tristán^b

^a Escuela de Nutrición, Universidad Peruana de Ciencias Aplicadas, Lima, Peru

^b Escuela de Medicina, Universidad Peruana de Ciencias Aplicadas, Lima, Peru

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KEYWORDS

Mobility limitation;
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Abstract

Objective: To assess the relationship between physical performance (PP) and muscle strength (MS) in elderly subjects with and without diabetes in a public hospital of Lima, Peru.

Subjects and method: A cross-sectional analysis of subjects aged 60 years or older with and without diabetes. MS was measured with a handheld dynamometer, and PP with the "timed get-up-and-go" test. Nutritional status was determined using body mass index, body fat percentage measured with a handheld fat loss monitor and protein intake based on the 24-hour recall. Age, sex, and history of hospitalization and supplementation were also recorded. The association was assessed using adjusted prevalence ratios.

Results: Overall, 139 patients with diabetes (26.6% with low PP and 13.7% with decreased MS) and 382 subjects without diabetes (36.6% with low PP and 23.0% with decreased MS) were evaluated. No association was found between T2DM and MS (aPR: 0.99; 95% CI: 0.67–1.57) or PP (aPR: 1.13; 95% CI: 0.84–1.52). Protein and supplement consumption was also unrelated ($p > 0.05$); however, history of hospitalization, age, sex, nutritional status, and body fat percentage were related ($p > 0.05$).

Conclusions: No association was found between T2DM, MS, and PP. However, low PP was associated to female sex and overweight/obesity, and decreased MS was associated to high body fat percentage and underweight. Moreover, MS and PP were related to older age and history of hospitalization.

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* Corresponding author.

E-mail address: titidejos@hotmail.com (C. Dejo-Seminario).

PALABRAS CLAVE

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Rendimiento físico y fuerza muscular en pacientes adultos mayores con diabetes y sin diabetes de un hospital público de Lima (Perú)

Resumen

Objetivo: Evaluar la asociación entre la fuerza muscular (FM) y el rendimiento físico (RF) en adultos mayores con y sin diabetes de un hospital público de Lima (Perú).

Pacientes y método: Estudio transversal en pacientes ≥ 60 años con y sin diabetes. Se midió la FM con dinamómetro manual y el RF con prueba «timed get-up-and-go». Se determinó el estado nutricional con el índice de masa corporal, el porcentaje de grasa corporal con bioimpedanciómetro manual y se evaluó el consumo proteico mediante recordatorio de 24 h. Además, se registró edad, género, antecedente de hospitalización y suplementación. Se evaluó la asociación con razones de prevalencias ajustadas (RPa).

Resultados: Se evaluó a 139 pacientes con diabetes (26,6% con bajo RF y 13,7% con FM disminuida) y a 382 sin diabetes (36,6% con bajo RF y 23,0% con FM disminuida). No se halló asociación de DM2 con FM (RPa: 0,99; IC 95%: 0,67-1,57) ni con RF (RPa: 1,13; IC 95%: 0,84-1,52). Tampoco se asoció el consumo proteico ni de suplementos ($p > 0,05$), pero sí el antecedente de hospitalización, la edad, el género, el estado nutricional y el porcentaje de grasa corporal ($p < 0,05$).

Conclusiones: No se encontró asociación entre DM2, FM y RF. Sin embargo, el bajo RF se asoció con ser mujer y presentar sobrepeso/obesidad y tener la FM disminuida, con tener alto porcentaje de grasa corporal y bajo peso. Además, ambos se relacionaron con el aumento de edad y tener antecedente de hospitalización.

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Introduction

The health of elderly subjects goes beyond the presence or absence of any disease; what matters is their “functional capacity”. The aging process is not a disease; it is however considered a high risk factor for increased morbidity and mortality, particularly if accompanied by an inadequate lifestyle or a disease affecting the functional reserve.¹

Elderly subjects are usually at greater risk of experiencing some metabolic disease, such as type 2 diabetes mellitus (T2DM).² In this regard, according to the International Diabetes Federation (IDF) there were 107 million adults aged 60–79 years with diabetes worldwide in 2010, and an increase to 196 million sufferers is predicted for 2030.³ According to recent epidemiological surveys in the United States, the prevalence of diabetes in adults over 65 years of age ranges from 22% to 33%.⁴

In this context, T2DM not only increases morbidity and mortality in elderly subjects,⁵ but also affects their functional capacity.² T2DM has been seen to be associated with decreased muscle strength (MS) and physical performance (PP) in elderly subjects.^{2,6} These indicators do not only serve as predictors of the quality of life, but are also potent predictors of the life expectancy and mortality of individual elderly subjects.⁷ Their early control is therefore important.

It is thus relevant to assess these associations in elderly subjects in order to prevent further impairment of their functional capacity and a greater increase in morbidity and mortality from diabetes itself. The study objective was therefore to compare MS and PP in elderly subject with and without diabetes.

Patients and methods**Study design and site**

A comparative, cross-sectional study was conducted from September 2014 to March 2015 of elderly patients attending the outpatient clinics of Endocrinology, Geriatrics and Nutrition of Hospital Nacional Hipólito Unanue (HNHU), a national reference hospital of the Ministry of Health located in Lima (Peru).

Population and sample

Two groups of patients aged 60 years or above who attended the outpatient clinic of HNHU were recruited. Patients with diabetes had a diagnosis of T2DM in their clinical histories, while patients without diabetes had had a measurement of fasting blood glucose in the previous six months < 110 mg/dL.⁸ The capillary blood glucose levels of all patients without diabetes were tested (using a One Touch® glucose meter), and were required to be < 110 mg/dL in fasting conditions or < 140 mg/dL in postprandial conditions.⁸ They were also required not to have had a history of taking glucose-lowering drugs or a diagnosis of prediabetes.

Patients from both groups with a history of liver cirrhosis, end-stage chronic kidney failure, advanced heart failure, chronic obstructive pulmonary disease, cancer, HIV, impaired consciousness, limb amputation, metallic implants, pacemakers or defibrillators, or hand osteoarthritis were also excluded from the study, as were patients using walkers or wheelchairs or with a history of hospitalization

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