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ORIGINAL ARTICLE

Relationship between anthropometric and echocardiographic variables. Implications for donor selection in cardiac transplantation

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KEYWORDS
Body size;
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Abstract
Background and objectives: Weight mismatch has been a controversial issue in the literature and there is also no agreement on the anthropometric parameter that best predicts outcome in such cases. The purpose of this study was to correlate anthropometric and echocardiographic variables to adequately select donors for cardiac transplant.
Methods: A total of 399 adult patients with normal echocardiograms were prospectively and consecutively included. Patients with coronary risk factors, systemic diseases and poor acoustic windows were excluded.
Results: The mean age of the population was 43 ± 17 years and 39% were male. All anthropometric variables were associated in a linear, positive and statistically significant manner with each of the echocardiographic variables. Marked variations in weight were accompanied by lesser variations in end-diastolic diameter in both men and women.

End-diastolic diameter was greater in patients with normal weight compared to low-weight patients (4.46 ± 0.83 cm vs 4.09 ± 0.68 cm), $p = 0.013$, and in overweight compared to normal weight patients (4.61 ± 0.88 cm vs 4.46 ± 0.83 cm), $p = 0.010$, whereas there was no difference between obese and overweight patients (4.74 ± 1.14 cm vs 4.61 ± 0.88 cm), $p = 0.760$.
Conclusion: Although anthropometric variations are associated with changes in heart size, such changes are not echocardiographically relevant. This exploratory study opens the door to further

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investigations to define the donor-recipient anthropometric threshold for accepting an organ in cardiac transplantation.

PALABRAS CLAVE
Antropometría;
Trasplante cardíaco;
Ecocardiografía

Relación entre variables antropométricas y ecocardiográficas. Implicancias para selección de donantes en el trasplante cardíaco

Resumen
Introducción y objetivos: Las disparidad antropométrica ha sido un tema controversial en el trasplante cardíaco. No hay acuerdo acerca de cuál es la medida antropométrica que mejor predice la evolución en estos casos. El propósito del estudio fue correlacionar las variables antropométricas con las ecocardiográficas para la selección de donantes en el trasplante cardiaco.
Métodos: Se incluyeron prospectivamente 399 pacientes con ecocardiograma normal. Se excluyeron a pacientes con factores de riesgo coronarios y enfermedades sistémicas.
Resultados: La edad media fue de 43 años y el 39% fueron hombres. Todas las variables antropométricas se asociaron en forma lineal, positiva y estadísticamente significativa con cada una de las variables ecocardiográficas. Grandes variaciones en el peso se acompañaron de variaciones menores en el diámetro de fin de diástole en ambos sexos.

El diámetro al final de la diástole fue mayor en los pacientes con normopeso respecto a aquellos con bajo peso (4.46 ± 0.83 cm vs 4.09 ± 0.68 cm), $p = 0.013$ y en los pacientes con sobrepeso en relación a aquellos con normopeso (4.61 ± 0.88 cm vs 4.46 ± 0.83 cm), $p = 0.010$; mientras que no hubo diferencias entre los pacientes con obesidad y sobrepeso ($p = 0.760$).
Conclusión: Las variaciones antropométricas si bien se asocian a variaciones en el tamaño del corazón, estos cambios no son clínicamente relevantes. Este estudio exploratorio abre la puerta para investigaciones futuras para definir el umbral de aceptación de órganos respecto de la relación antropométrica entre donante y receptor.

Introduction

The prevalence of heart failure in the United States is on the increase.[1] Medical treatment has been shown to reduce mortality rates and re-admissions to hospital and in the more advanced forms, the treatment of choice is orthotopic heart transplant.[2–9] There is a continuous rise in the number of patients on the waiting list, but no increase in the number of donors, so many patients die before having access to a transplant. Broadening donor acceptance criteria could be a strategy for changing this situation. The disparity in anthropometric variables has been a controversial issue in the literature. There are conflicting results when the donor's body size is smaller than the recipient. In these circumstances, some authors have reported a decrease in survival, while for others there is no difference.[9,10] There is also a lack of agreement on the anthropometric measurement that best predicts the outcome in these cases.[9–11] Moreover, the relationship between the various anthropometric variables and the echocardiographic variables that express the size of the heart is not fully understood. The purpose of this study was to correlate these variables for the appropriate selection of donors in cardiac transplantation.

Methods

Study population

We prospectively included 399 patients aged over 18 years with normal echocardiogram consecutively as they attended the echocardiography laboratory for various reasons in the period between January 2008 and June 2010. We excluded patients with coronary risk factors, systemic diseases and poor echocardiographic window. Normal echocardiogram was defined as the absence of structural or functional pathology at the time of evaluation.

Statistical analysis

Continuous variables were expressed as the mean and standard deviation; categorical variables as percentages. The correlation of anthropometric variables with echocardiographic variables was performed using simple linear regression. A subgroup analysis was then performed to test differences in both genders regarding the relationship between anthropometric and echocardiographic variables,