An Analysis of Cardiac Remodeling in the Elderly Population. EPICARDIAN Study

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The aims of this study were to investigate left ventricular morphology in a sample of elderly Spanish individuals and to assess differences between hypertensives and normotensives. Data were obtained from a subsample (N=242) of participants in the EPICARDIAN study who live in the Lista district of Madrid: they included 191 (78.8%) hypertensives and 51 (21.2%) normotensives. Left ventricular remodeling patterns were classified as: type I (normal), type II (concentric remodeling), type III (concentric hypertrophy) or type IV (eccentric hypertrophy). The overall prevalences were: 74 (30.5%) type I, 62 (25.9%) type II, 53 (21.8%) type III and 53 (21.8%) type IV. A comparison of hypertensives and normotensives showed that the prevalences were: 42 (22.3%) type I, 50 (26.1%) type II, 50 (26.1%) type III and 49 (25.5%) type IV in hypertensives and 31 (60%) type I, 13 (26%) type II, 3 (6%) type III and 4 (8%) type IV in normotensives (P<.0005). Ventricular remodeling without hypertrophy was common in the elderly, an observation that could have prognostic implications.

Key words: Cardiac remodeling. Left ventricular hypertrophy. Elderly.

INTRODUCTION

The aims of this study were to investigate left ventricular morphology in a sample of elderly Spanish individuals and to assess differences in this regard between hypertensive and normotensive subjects. The prevalence of cardiac remodeling increases with age, and is estimated to be 43% to 45% among individuals over age 65.1,3 In this group of patients, the prevalence of left ventricular hypertrophy (LVH) is around 15%.1,3 Abnormal left ventricular geometry has been associated with an increased mortality in this patient population1,3 and is higher in patients with hypertrophy.

METHODS

Data for this study were obtained from a patient subgroup of the EPICARDIAN study
The baseline characteristics of the initial sample are shown in Table 1. In all, 291 patients (78.6%) were hypertensive and 80 (21.4%) were normotensive. The mean age of the sample was 74 (6) years. Ejection fraction was 66.4% (9.7%) in normotensive and 70% (11.4%) in hypertensive patients (P<.14). The prevalence of diabetes was 9.2%. The prevalence of a poor acoustic window was 34.4% in the hypertensive group and 36.7% in the normotensive group (P=.7).

Of the 242 patients with a good acoustic window, 191 (78.8%) were hypertensive and 51 (21.4%), normotensive. Distribution by sex was 124 (51.2%) men and 118 (48.8%) women. By age, 152 (62.8%) were <75 years and 90 (37.2%) were ≥75 years. Patients who presented atrial fibrillation were excluded from the assessment.

Patients were considered to have a poor acoustic window if any of the following factors could not be measured with certainty in the parasternal long-axis view: end-diastolic diameter, end-systolic diameter, septum, or posterior wall. Patients in whom these measurements were possible were defined as having a good acoustic window. The 2 groups were compared in terms of weight, age, sex, height, body mass index, obesity, hypertension, diabetes, and smoking habits; however, no statistically significant differences were observed.

**Statistical Analysis**

The categorical variables were described by the distribution frequency, and the continuous variables were expressed as the mean (SD). In order to test the possible association between qualitative variables, we used the χ² or Fisher exact test. Data were processed and analyzed using SPSS, version 10.

**Table 1. Characteristics of the Population (n=371)**

<table>
<thead>
<tr>
<th></th>
<th>Normotensive</th>
<th>Hypertensive</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men, n (%)</td>
<td>48 (25.8)</td>
<td>135 (74.2)</td>
<td>.039</td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>32 (17)</td>
<td>156 (83)</td>
<td>.039</td>
</tr>
<tr>
<td>Sinus rhythm, %</td>
<td>91.7</td>
<td>94.6</td>
<td>.7</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>6.7</td>
<td>4.4</td>
<td>.7</td>
</tr>
<tr>
<td>Age, y</td>
<td>72 (5.8)</td>
<td>74 (6.5)</td>
<td>.052</td>
</tr>
<tr>
<td>Height, cm</td>
<td>161.5 (10.1)</td>
<td>159.6 (9.4)</td>
<td>.113</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>65.7 (9.9)</td>
<td>67.8 (12.2)</td>
<td>.147</td>
</tr>
<tr>
<td>Body mass index</td>
<td>25.1 (3)</td>
<td>26.6 (4.3)</td>
<td>.005</td>
</tr>
</tbody>
</table>

**RESULTS**

The baseline characteristics of the initial sample are shown in Table 1. In all, 291 patients (78.6%) were hypertensive and 80 (21.4%) were normotensive. The mean age of the sample was 74 (6) years. Ejection fraction was 66.4% (9.7%) in normotensive and 70% (11.4%) in hypertensive patients (P<.14). The prevalence of diabetes was 9.2%. The prevalence of a poor acoustic window was 34.4% in the hypertensive group and 36.7% in the normotensive group (P=.7).

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Statistical Analysis

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DISCUSSION

The results of this study show a lower overall prevalence of ventricular remodeling without LVH compared with previous studies, whereas the prevalence of LVH was similar. This difference may be due to methodological aspects or to the fact that our study did not include history of ischemic heart disease in the analysis.

The prevalence of cardiac remodeling in the overall population was similar when the sample was stratified by sex and age, and any differences were statistically insignificant. These results are similar to those reported in other series.

In addition, the comparison between hypertensive and normotensive patients showed a higher percentage of morphologic abnormalities in those with hypertension. The probability of normal morphology in older hypertensive patients was 1 out of 5, data similar to those observed in previous studies.

Limitations

The sample was recruited from the general population census of an area in Madrid with a high socioeconomic level, which could explain the low overall incidence of atrial fibrillation compared to other published series. Moreover, the history of ischemic heart disease was not analyzed. These considerations could lead to a lower statistical value.

REFERENCES