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# Valvular Heart Disease in Women: Sex Differences in Spain

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Although the prevalence of valvular heart disease is lower than that of other cardiovascular diseases, patients with the condition require a significant amount of care and place a burden on healthcare resources. No studies specifically designed to investigate possible sex differences in the characteristics of valvular heart disease have been carried out in Spain. The only studies that have provided relevant information are a number of limited observational studies, which were mainly carried out in Andalusia. These studies indicate that sex differences in the etiology and treatment of these conditions could exist. Specially designed studies are required to clarify the situation.

**Key words:** *Valvular heart disease. Sex differences. Etiology.*

## Valvulopatías en la mujer: diferencias de sexo en España

Las valvulopatías, aunque su prevalencia actual es menor que la de otras enfermedades cardiovasculares, siguen siendo una causa importante de necesidad de asistencia y consumo de recursos en nuestro entorno. No existen en nuestro país trabajos que hayan evaluado de forma específica si hay diferencias relacionadas con el sexo en las características de las enfermedades valvulares. Sólo registros parciales, realizados sobre todo en Andalucía, ofrecen algunos datos sobre estos aspectos e indican que puede haber diferencias relacionadas con el sexo en el perfil etiológico y en el manejo de estas lesiones. Son necesarios estudios específicos y diseñados para proporcionar respuestas sobre estos aspectos.

**Palabras clave:** *Valvulopatías. Diferencias de sexo. Etiología.*

## INTRODUCTION

Despite being less common than other cardiovascular diseases, such as heart failure or ischemic cardiomyopathy, valvulopathies remain a major underlying cause of requests for medical assistance and a drain on medical resources in Spain. However, little information is available as to the actual prevalence and clinical profile of the disease in the country as a whole; the numbers that are available come from surgical records[1-4] or global sources such as European records[5], which may not be representative of the local geographic and social environment. Furthermore, there have been no studies investigating the prevalence of valvular heart diseases in Spain.

On the other hand, heart valve disease has become a dynamic and evolving problem as a result of several factors, including an increase in the incidence of degenerative valvulopathies due to an increase in the mean age of the Spanish population that has resulted in significant comorbidities, and the eradication of rheumatic fever in Spain a few decades ago. Nevertheless, the sudden demographic changes that have been taking place over the last few years, with the influx of an immigrant population, have resulted in an increase in the number of cases in younger patients, among them pregnant women, a situation that was rarely seen in the prior two decades. Furthermore, if one wanted to examine sex-related differences with respect to valvulopathies, one would find that there is even less information available. Even the most important study on the profile of heart valve diseases in the country, the Euro Heart Survey on Valvular Heart Disease refers to sex only twice. In this study, we review the limited information available on sex-related differences in the diagnosis and treatment of valvulopathies in our country.

## AVAILABLE STUDIES

### Euro Heart Survey on Valvular Heart Disease

This study was designed to identify the characteristics, treatments and evolution of patients

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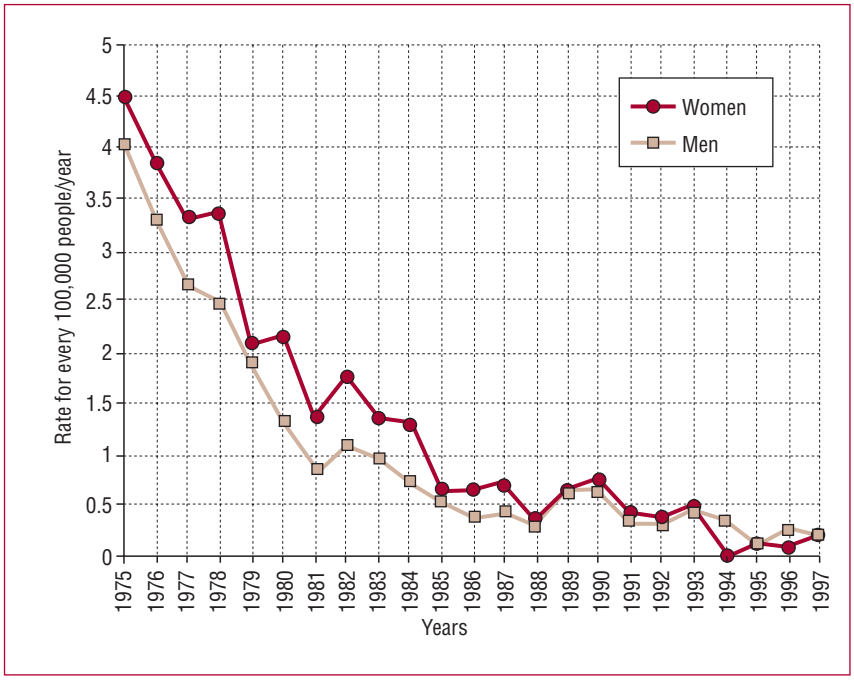


**Fig. 1.** Evolution of the standardized death rate due to chronic rheumatic heart disease. Andalucía, 1975-1997.

with valvulopathies in Europe. It was conducted from April to June of 2001 across 922 centres in 25 countries, and included 5,001 adults with moderate or severe valvular heart disease, endocarditis or a previous valve surgery. Of the patients studied, 49.5% were women. Nevertheless, no specific analysis was conducted as to the role of sex in the aetiology, diagnosis or treatment of the disease. The only reference to sex was that 46.7% of the patients that had undergone a valve surgery were women. Spain was an active participant of this survey, contributing 609 patients, yet no information is available as to the sex of the se patients.

## Andalusian Statistics Institute

The data derived from the mortality statistics in Spain may be unreliable due to a variety of reasons, from the irregularity and lack of precision in death certificates to the nomenclature sometimes used to classify the deaths. Nevertheless, these data can provide an fairly representative, if perhaps somewhat fuzzy, overview of the situation. From this information, we can confirm a well known fact, which is the absence of rheumatic fever, and thus, a decrease in the number of deaths due to rheumatic heart valve diseases. This decrease is identical for both men and women (fig. 1). From further analysis of the data, specifically looking at the year 2000, we can observe that the main cause of death due to valvulopathies was non-rheumatic aortic valve disease, with a slightly higher incidence in women than men, especially for patients over 75 years of age. The incidence of non-rheumatic mitral valve diseases was higher in women across all age groups (fig. 2).

## Andalusian registry of valvulopathies

The Andalusian registry of valvulopathies collected patient data for all hospital admissions as a result of problems directly related with severe valvular heart disease in the years 2001, 2002, and 2004 across eight Andalusian hospitals[6]. The general characteristics of the patients are shown in tables 1 and 2 for each year. There are 733 patients in the registry, of which 655 can be analysed according to sex. Despite being limited to three years, of which only the last trimester of 2001 is available, the data

TABLE 1. **General characteristics of patients with valvulopathies (Andalusian registry of valvulopathies 2001-2004)**

| | 2004 (n = 287) | 2002 (n = 368) | 2001 (n = 78) |
|---|---|---|---|
| Age (years) | 69.3 ± 12 | 67.6 ± 12 | 69.1 ± 16 |
| Men | 40.8 | 47.6 | 52.1 |
| Rheumatic fever | 22.6 | 20.7 | 23.3 |
| Ischemic cardiopathy | 10.3 | 5.7 | 16.4 |
| Previous valve surgery | 12.9 | 14.4 | 9.6 |
| Hypertension | 53.3 | 39.7 | 45.2 |
| Diabetes mellitus | 27.9 | 24.7 | 19.2 |
| Dyslipidemia | 24.0 | 15.2 | 15.1 |
| Smoking | 16.0 | 15.5 | 19.2 |

Data are either percentage or mean ± standard deviation.

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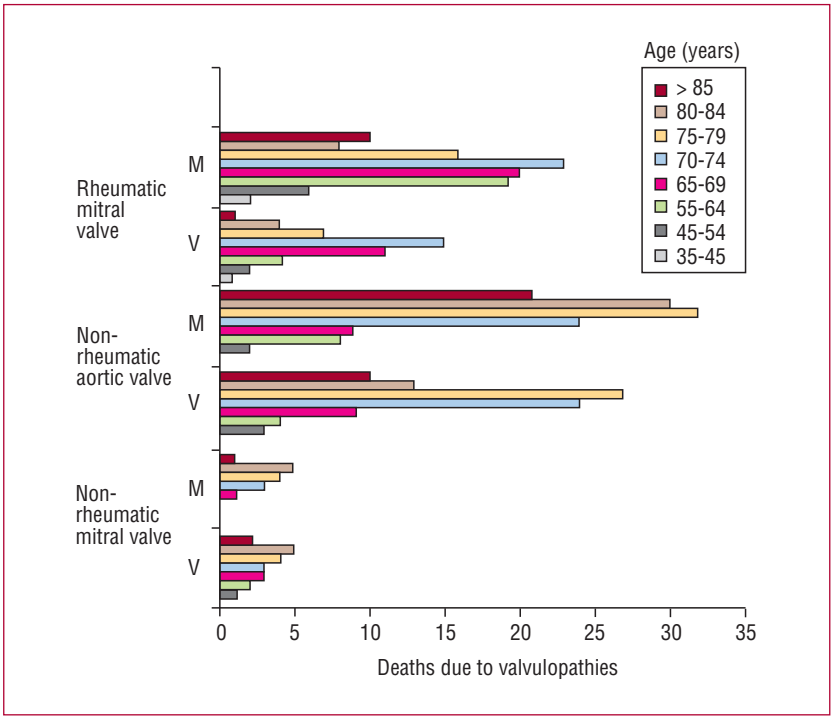


**Fig. 2.** Death rate due to valvulopathies for different age groups. Andalucía, 1975-1997. M: men; W: women.

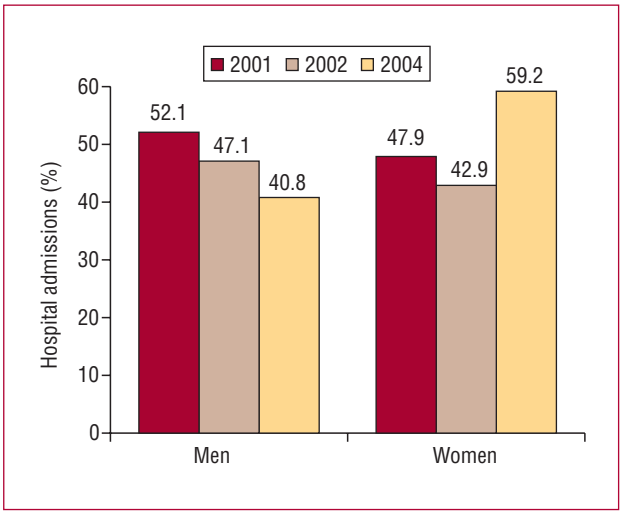


**Fig. 3.** Percentage of hospital admissions due to significant valvulopathies by sex in the Andalusian registry of valvulopathies.

TABLE 2. **General characteristics of patients with valvulopathies in the Andalusian registry of valvulopathies according to sex**

| | Men (n = 291) | Women (n = 364) | p |
|---|---|---|---|
| Age (years) | 67.8 ± 11 | 68.0 ± 12 | |
| Rheumatic fever | 12.3 | 28.9 | < 0.05 |
| Ischemic cardiopathy | 11.5 | 9.5 | |
| Previous valve intervention | 12.0 | 15.2 | |
| Hypertension | 42.8 | 47.9 | |
| Diabetes mellitus | 22.3 | 29.2 | |
| Dyslipidemia | 17.5 | 20.4 | |
| Smoking | 26.4 | 7.2 | < 0.05 |

Data are either percentage or mean ± standard deviation.

illustrate a rising trend in the percentage of women with severe valve disease that were admitted to hospitals during that time (fig. 3).

There are no sex-related differences with respect to the reasons for hospital admittance, although there was a non-significant trend suggesting a higher incidence of heart failure in women and angina in men (figs. 4 and 5). The women with severe valvulopathy present haemopathies (mostly anaemia) at a higher frequency compared to men, whereas in men, concomitant pneumopathies (chronic obstructive pulmonary disease, COPD) were three times more frequent than in women. Men also had a higher tendency to suffer from renal failure, but this was not statistically significant (fig. 6).

In the Andalusian registry, the doctors treating the patients also assigned the aetiology based on the clinical criteria used to discharge the patient. When evaluating the causes of severe valve disease and segregating them by sex, rheumatic aetiology was the predominant cause in women (32.3% of women, 14.4% of men). Although degenerative causes were the most frequent in women (44.6%), they actually occur at a slightly lower proportion than in men. The remaining aetiologies (ischemic, congenital, and so on.) tended to be more frequent in men, but without

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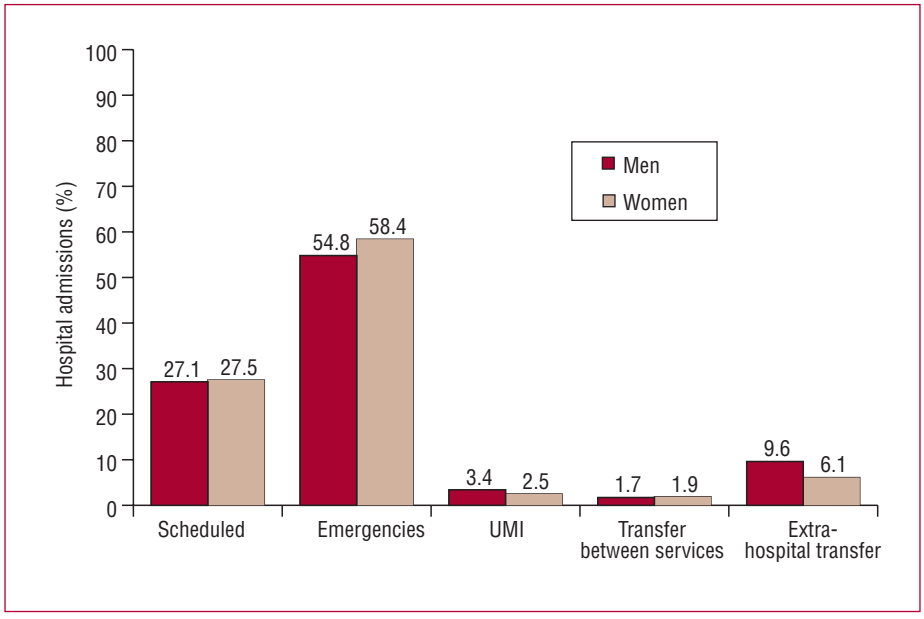


**Fig. 4.** Source of admitted patients. Andalusian registry of valvulopathies.

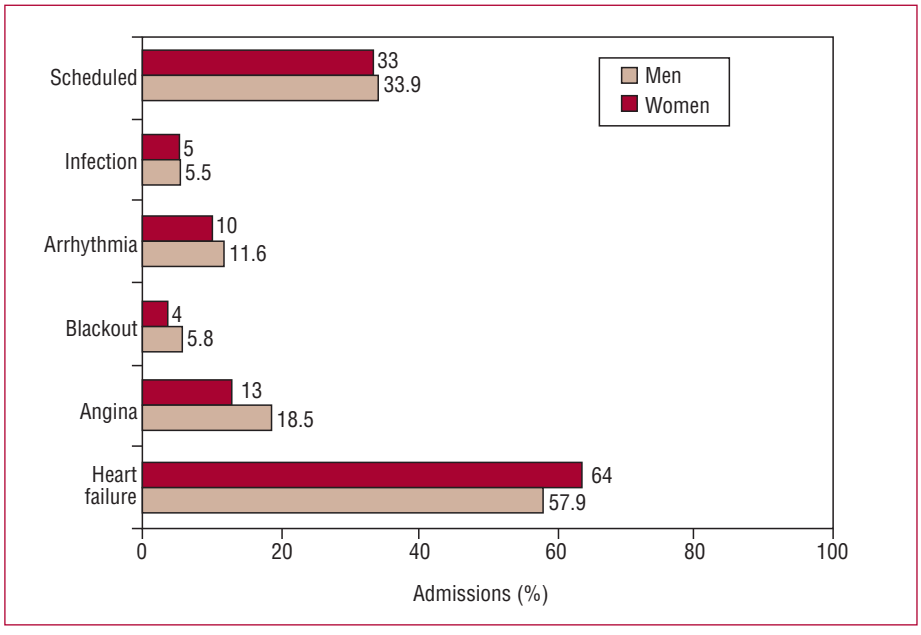


**Fig. 5.** Reason for admission. Andalusian registry of valvulopathies. This excludes angina and heart failure in women.

achieving significance (fig.7). This aetiological profile shows that most women suffer from mitral stenosis (of rheumatic origin) and tricuspid problems (both stenosis and regurgitation). It should be noted that aortic valve regurgitation was more frequent than stenosis (fig. 8). In view of the aetiological distribution of valvulopathies in women, it follows that there is a higher proportion of moderate or severe ventricular dysfunction in men (fig. 9).

Using the data from this registry, we also analyzed the implementation of procedures and therapeutic options with respect to gender. There were no differences in use of echocardiography, but differences were found in the implementation of coronarography. This is related to the higher incidence of ischemic cardiomyopathy and cardiovascular risk factors in men, which makes pre-surgical coronary evaluation necessary. More valvuloplasties are performed in women, but there are no noticeable differences with respect to the implementation of valve replacement surgeries. It is striking that the reason for discharging women has a greater correlation to clinical improvement (45% in

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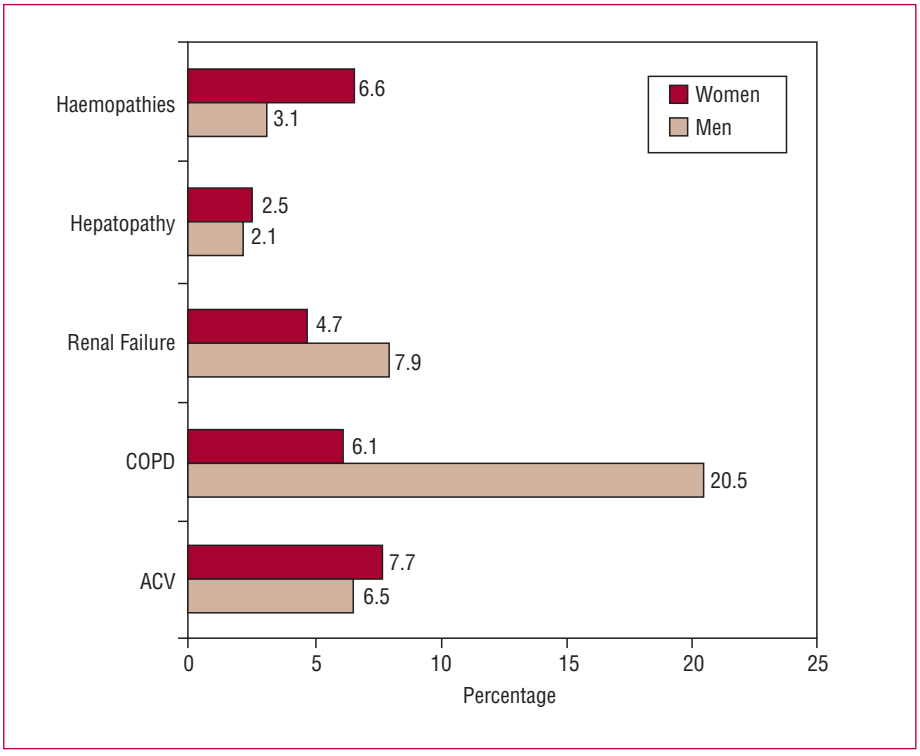


**Fig. 6.** Comorbidities depending on the sex of the patients (Andalusian registry of valvulopathies).

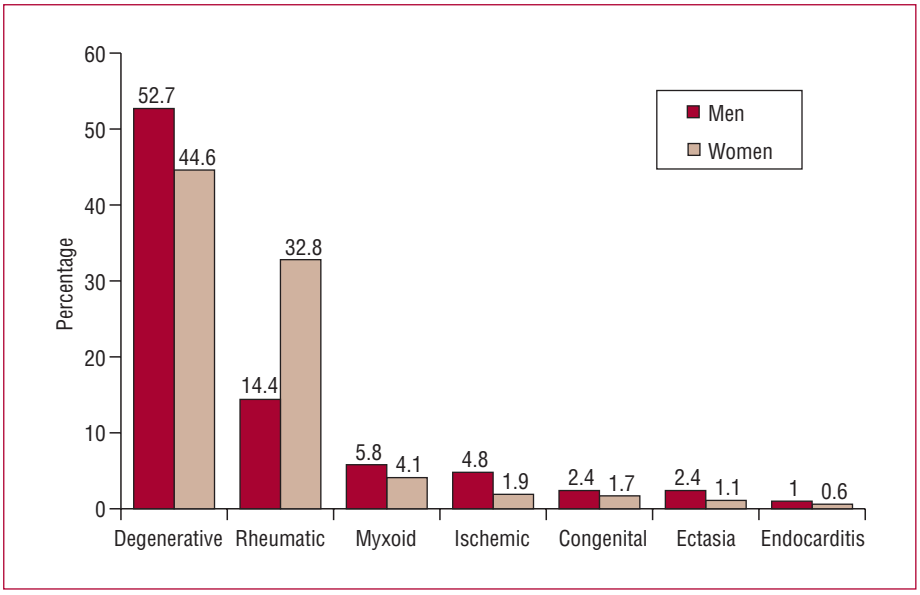


**Fig. 7.** Aetiology of valvulopathies according to sex (Andalusian registry of valvulopathies).

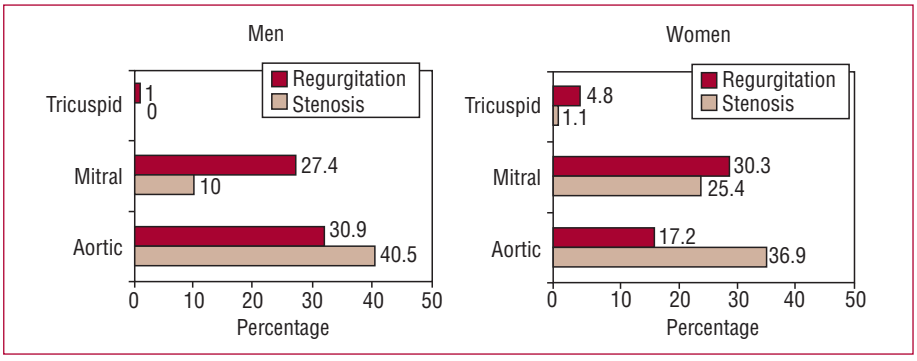


**Fig. 8.** Affected valve by sex (Andalusian registry of valvulopathies).

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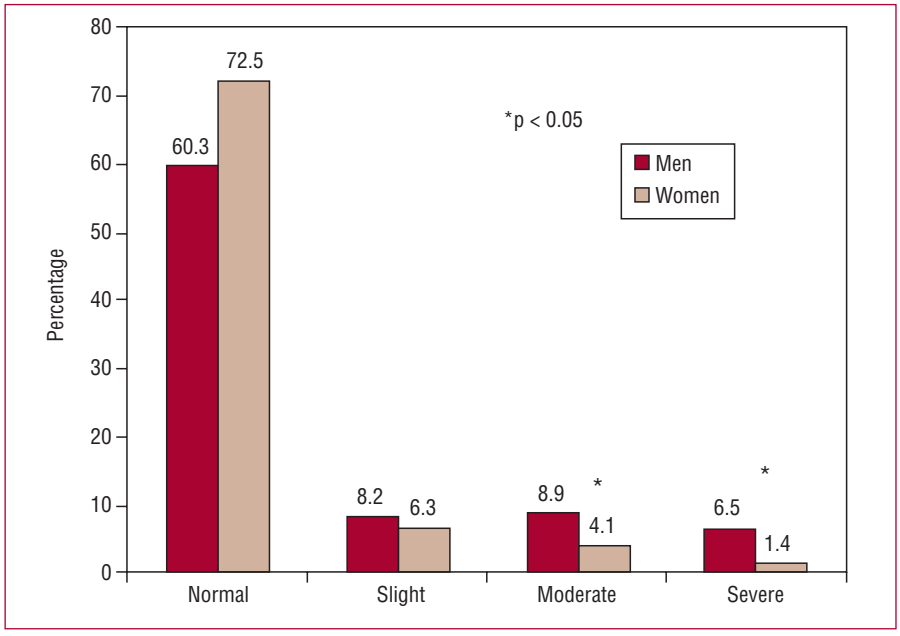


**Fig. 9.** Level of left ventricular systolic function by sex (Andalusian registry of valvulopathies).

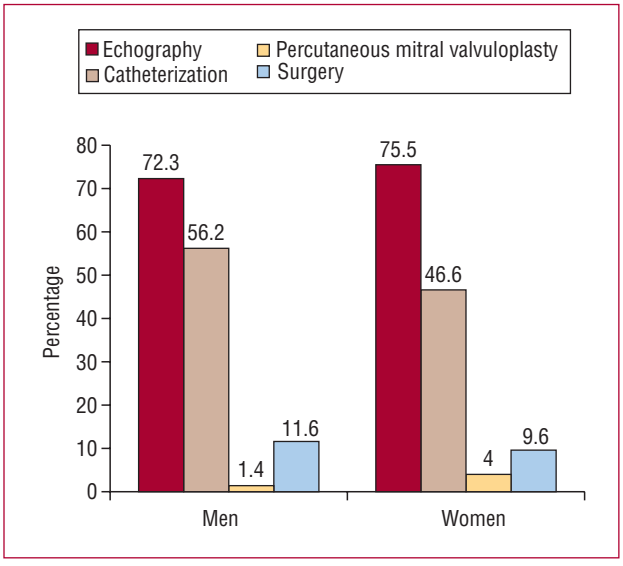


**Fig. 10.** Treatments and tests undertaken in valve disease patients from the Andalusian registry of valvulopathies, by sex.

women vs. 35.2% in men) and a more conservative approach in general (figs. 10 and 11).

## CONCLUSIONS

The limited data available in Spain suggest a differential profile of the aetiology of valvulopathies by sex, with the rheumatic aetiology being the predominant cause among women and ischemic or congenital aetiology being more common in men. The frequency of the degenerative aetiology did not differ between women and men. The lack of reliable and up-to-date references regarding the spectrum of valvulopathies, particularly

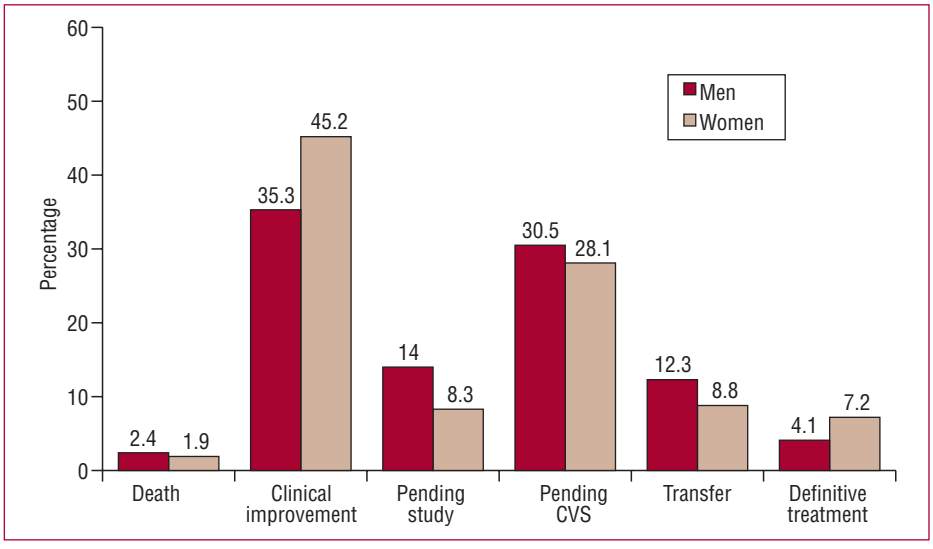


**Fig. 11.** Final outcome of admitted patients (Andalusian registry of valvulopathies). CVS: cardiovascular surgery.

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with respect to whether there are differences in the aetiological profile, diagnosis and handling of these diseases between male and female patients, highlights the need for the design of a registry in Spain to gather the new information that is needed.

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