Research Article

iMedPub Journals
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Health Science Journal
ISSN 1791-809X

2017
Vol.11 No.2:490

DOI: 10.21767/1791-809X.1000490

Frequency of Calcific Aortic Stenosis in Tertiary Care Hospital of Karachi

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Received date: 07 December 2016; **Accepted date:** 06 March 2017; **Published date:** 15 March 2017

Citation: Afaq E, Nisar MK, Habib S. Frequency of Calcific Aortic Stenosis in Tertiary Care Hospital of Karachi. Health Sci J 2017, 11: 2.

Abstract

Background: Calcific aortic stenosis (AS) has become one of the most frequent types of Valvular Heart Disease (VHD) among elderly patients. Prevalence of aortic valve disease (AVD) increases with age and the incidence of calcific AS are on the rise as the general age of the population increases.

Objectives: This study was conducted to find out the frequency of calcific AS in patients of tertiary care hospital.

Methods: The cross sectional study was carried out in National Institute of Cardiovascular Disease (NICVD) during the period of January to December 2012 after institute approval. A total of 50 echocardiographically diagnosed elderly patients of calcific AS were included from OPD and echocardiography department. All patients were evaluated for clinical features, ECG, echocardiographic findings and outcome were noted and analyzed by using software SPSS version 21.

Results: In our study we found 62% male and 38% female. The mean age was 67.12 years ± 5.08 with the range of 60 to 85 years. On echocardiography, out of 50 AS selected patients 18% had mild AS, 22% had moderate AS, and 60% had severe AS. One bicuspid aortic valve has been found.

Conclusion: In elderly calcific AS constitutes a significant health problem. As the age advances it is an important cause of cardiovascular mortality and morbidity.

Keywords: Valvular heart diseases; Cardiovascular; Heart diseases; Calcific AS

Introduction

Valvular Heart Diseases (VHD) are regarded as one of the major public health concern. A significant rise in the prevalence of cardiac valve disease with age is observed in a recent large study [1]. Non-rheumatic stenosis of tri-leaflet aortic valves, often termed senile or calcific valvular aortic stenosis, is considered a "degenerative" process [2]. Aortic stenosis is a serious disease with a prolonged latent period, progresses very fast when symptoms become evident and a very high mortality rate is associated (approximately 50% in the first 2 years after symptoms appear) among untreated patient [1,3].

By 2050 population aged ≥ 65 years is expected to rise by two-fold due to a drastic change in age structure in the western world. In the year 2000, it was estimated that 10.9% of the total population was aged between 64-85 years and this proportion is expected to be increased to 16% by 2050. Furthermore, it is also estimated that by 2050, 4.3% of the population will be comprising of individuals with ≥ 85 years of age, which is more than two-fold rise from 2010 [4].

Keeping in view the growth rate, it is expected that adult population aged ≥ 85 years will increase from 5.8 million in 2010 to 19 million by 2050 which is a 228% rise. This indicates considerable burden of cost of treatment related to cardiovascular disease in terms of morbidity and mortality [4,5].

In Cardiovascular Health Study (CHS), it was shown that in patients aged 65-74 years the prevalence of AS is increased from 1.3% to 2.4% when compared with those aged 75-84 and 4% increase among those ≥ 85 years. The burden of disease due to severe AS in elderly patients is remarkable with a pooled prevalence of 3.4%. This represents increase in the incidence of AS due to general increase of age in the population [6]. Poor prognosis with 2 year mortality rate of 50-60% and 3 year survival rate of less than 30% is evident if the severe symptomatic AS remains untreated [6,7]. Males are affected most frequently [8].

This study was undertaken to elucidate the frequency of aortic valve stenosis in the elderly patients visiting tertiary care hospital in Karachi.

Materials and Methods

This is a cross-sectional study conducted in National Institute of Cardiovascular Disease (NICVD) Karachi-Pakistan during the period of January to December 2012 after approval from Ethical Committee NICVD. Non probability purposive sampling was performed and a total of 50 echocardiographically diagnosed elderly patients of calcific aortic stenosis were included from OPD, emergency (ER) and echocardiography department. Patients came to NICVD from all provinces of Pakistan. Most of the patients to OPD or ER with the complaint of chest pain, shortness of breath, orthopnea, syncope, systolic hypertension and/or systolic murmur. Clinical examination, ECG and echocardiography have been carried out. Echocardiographic findings and outcome were noted and analyzed. Toshiba Aplio with cardiac protocol was used and performed by a qualified doctor echocardiographer. Patients were grouped into three on the basis of echocardiographic finding by 2D, color Doppler and both qualitative and quantitative evaluation by continuous and pulse wave Doppler and severity was assessed by using continuity equation. As is defined as calcified and/or thickened aortic leaflets with restricted movement of leaflet during systole. Mild, moderate, severe AS was defined as Mean gradient <20 mmHg and valve area is ≤ 2.0 cm^2, Mean gradiant 20-39 mmHg and valve area 1-2 cm^2 , Mean gradient ≥ 40 mmHg with valve area ≤ 1, respectively [9,10]. Patients who had severe aortic regurgitation, prosthetic valves, familial hypercholesterolemia (total cholesterol >300 mg/dl in adults) and cancer were excluded from our study. We have also eliminated the patients from our study who have history of endocarditis, chronic renal failure, rheumatoid arthritis, rheumatic fever or rheumatic heart disease and echocardiographic evidence of rheumatic valvular stenosis.

Data was entered in Microsoft Excel and analyze using SPSS version 21. Descriptive analysis was done according to the type of variable. For numeric data mean and standard deviation was calculated whereas for categorical data frequency and percentages.

Results

Fifty aortic stenosis patients have been observed during the study period. The age distribution and gender among AS patients is presented in **Table 1**. The mean age and standard deviation for the AS patients was 67.12 years ± 5.08 with the range of 60 to 85 years. There were 62% male and 38% female.

On echocardiography out of 50 AS selected patients 18% had mild AS, 22% had moderate AS and 60% had severe AS. Out of 50 cases we found only one patient with bicuspid aortic valve **(Table 2)**.

Table 1 Demographic profile of aortic stenosis patients.

Variables		Aortic Stenosis Patients
Age	Mean ± SD	67.12 ± 5.08
	Range	60 - 85
Gender	Males	31 (62%)
	Females	19 (38%)
SD: standard deviation, yr: years, Range: minimum-maximum, Percentage: %		

Table 2 Grouping of aortic stenosis patients.

Aortic Stenosis	Frequency (n)	Percentage (%)
Mild	9	18%
Moderate	11	22%
Severe	30	60%

Discussion

In this study we have demonstrated the frequency of non-rheumatic calcific aortic stenosis in the patient coming to tertiary care hospital of Karachi. Fifty calcific AS patients with minimum age of 60 years were seen in our study whereas in comparison to other studies in western world calcific AS was present in patients over 65 years of age this may be due to the fact that actual birth dates are quite often unknown because many individuals in Asia do not have an official record of their birth date [11-13].

It is evident by many studies that in general population men and women were equally affected by most of the VHD [1]. In our study calcific AS was shown to be more common in males (62%) as compare to females (38%) with a male to female ratio of 1.6:1. This result was in accordance with studies conducted by Nkomo et al. [1] and Otto et al. [14], this is because of the fact that male gender is one of the risk factor for calcific AS [7,15].

According to epidemiological studies in people aged 75 years and older moderate or severe AS is seen in more than one in eight people [16]. Valvular heart diseases often remains underdiagnosed in the population as most of the patients reported after the symptoms exacerbated. This is the reason we found more calcific AS cases in severe form. This is in concordance to the study says that many patients with symptoms of severe AS do not consult for expert opinion about valve replacement [16].

Conclusion

VHD represents an important health issue of public concern as moderate to severe valvular disorders with the increase in age are common in our population. Appropriate measures should be adopted in order to make accurate and timely diagnosis and treatment of the disease.

Acknowledgement

Authors acknowledged Dr. Habiba and her team for her contribution in echocardiographic diagnosis of calcific aortic stenosis.

Funding

None.

Conflict of interest

None stated.

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