

Original Article

Prevalence of mitral valvar prolapse in young athletes

Absalom D. Hepner,¹ Holly Morrell,⁴ Seaneen Greaves,⁴ Jeff Greaves,⁴ Mohammad Reza Movahed^{2,3,4}

¹University of California, Irvine Medical Center, Orange, California; ²Sarver Heart Center, University of Arizona College of Medicine, Tucson, Arizona; ³Department of Medicine, Division of Cardiology, Southern Arizona VA Health Care System, Tucson, Arizona; ⁴A Heart For Sports, Yorba Linda, California, United States of America

Abstract *Background:* The prevalence of mitral valvar prolapse has been reported to be between 0.6 and 21%. The goal of our study was to evaluate its prevalence in young athletes who underwent hand-held echocardiography as a screening mostly in southern California. *Methods:* We retrospectively analyzed 1742 echocardiograms that were performed as a part of a cardiac screening of teenage athletes. The total prevalence of mitral valvar prolapse was calculated and stratified based on gender. *Results:* We screened a total of 1172 male and 570 female high school athletes. The echocardiographic prevalence of mitral valvar prolapse was 0.9%. The prevalence was similar in both genders, at 1.2% in male and 0.7% in female athletes. *Conclusion:* The prevalence of mitral valvar prolapse in young athletes mostly in southern California was found to be less than 1%, and was similar in both genders.

Keywords: Echocardiography; congenital valve disease; screening; epidemiology; teenage athletes

THE PREVALENCE OF MITRAL VALVAR PROLAPSE HAS been debated since its first description in the 1960s.^{1,2} Previously reported prevalence has been varied between 0.6 and 21%.^{1,3} While some of the early differences can be ascribed to competing methods of identification, the debates have persisted in regards to prevalence, despite of the acceptance of cross-sectional echocardiography as the gold standard, and the established guidelines regarding appropriate definitions, for diagnosis.^{4,5}

To date, the studies reporting prevalence have been limited by either evaluating one gender, specific ethnicities or a narrow range of age groups.^{6–19} Some studies evaluated patients from hospitals, while others used volunteers.^{8,9,18}

The goal of our study was to evaluate the prevalence of mitral valvar prolapse in young athletes. The database we used was created from echocardiographic

examinations of healthy young athletes performed by “A Heart for Sports”, which is a non-profit organization with the goal of prevention of sudden cardiac death in athletes by detection of asymptomatic hypertrophic cardiomyopathy using screening echocardiography. This database is a more realistic representation of a healthy population, comprising young athletes undergoing echocardiography for preventative care.

Methods

We retrospectively analyzed 1742 echocardiograms that were performed as a part of cardiac screening of teenage athletes mostly in southern California. The total prevalence of mitral valvar prolapse was calculated and stratified based on gender. The screenings were organized by “A Heart for Sports”. The athletes were recruited through advertisements, and by contacting local schools. Echocardiograms were performed by experienced echocardiographers, and interpreted by volunteer cardiologists onsite. Echocardiographers and interpreting cardiologists were instructed to document any cardiac abnormalities, including mitral valvar

Correspondence to: M. Reza Movahed, MD, PhD, FACP, FACC, FSCAI, University of Arizona Sarver Heart Center, 1501 N Campbell Avenue, Tucson, AZ 85745, USA. Tel: (520) 626 6223; Fax: (520) 626 5181; E-mail: rmovahed@email.arizona.edu; rmova@aol.com

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prolapse, and the thickness of the anterior and posterior myocardial walls. All cardiologists reading the echocardiograms were board certified, or eligible, in cardiovascular disease, and were reading echocardiograms in their own practice. The echocardiographers and cardiologists were also volunteers. The study data was collected mostly in the southern California. The screenings were free of charge, and sponsored by various donations from the community. The diagnosis of mitral valvar prolapse was made by cardiologists using standard echocardiographic criteria.⁵ The prevalence of the mitral valvar prolapse was calculated and stratified based on gender and age using SPSS statistical program version 13.

Results

A total of 1742 echocardiograms were available for our study. They were obtained from 1172 male, and 570 female, athletes. The mean age of those shown to have prolapse was 18.9 plus or minus 9.6 years, as opposed to 17.5 plus or minus 8.2 years in those without mitral valvar prolapse. Echocardiographic prevalence of the lesion was 0.9%. This prevalence was similar in both genders, at 1.2% in male and 0.7% in female athletes. Prevalence was also similar between the athletes being older or younger than 15 years, being found in 0.6% of athletes less than 15 years, and 1.1% in those older than 15 years ($p = 0.25$).

Discussion

We have shown that the prevalence of mitral valvar prolapse in a young and unselected population mostly in southern California was less than 1%, and was similar in both genders. Previous studies have reported the prevalence of mitral valvar prolapse as high as 21%.^{3,9} Many of these studies were limited by the size of their sample, or by their demographic groups.⁶⁻¹⁹ The largest study evaluating the prevalence of mitral valvar prolapse in the general population involved 3491 subjects enrolled in the Framingham Heart Study.²⁰ They reported an overall prevalence of 2.4%, with 2.1% in males and 2.7% in females. Flack et al.¹³ studied 4136 young adults, reporting a prevalence of less than 1%, which is consistent with our findings. Recently, using a very large echocardiographic data base of over 24,000 patients of all ages who were referred for echocardiography for clinical reasons, we found a similarly low prevalence of mitral valvar prolapse, consistent with our result in this study.²¹ This similarity in prevalence in 2 different data bases supports the validity of the findings. One of the strengths of our

study is the large sample size, and its “real-world”, nature, since all echocardiographic examinations were included for screening, regardless of the age of the subject, gender, ethnicity, or reason for study. Our data, nonetheless, was extracted from databases, so that we could not review the examinations ourselves, nor independently verify the diagnoses. The echocardiograms were interpreted by different cardiologists, and we cannot determine the inter-observer variability or adherence to established guidelines. It is also possible that a very small number of young teenagers with severe regurgitation secondary to mitral valvar prolapse could have been excluded from high school athletic activities and, therefore, not captured in our calculations. Despite these potential caveats, it remains a fact that we have found the prevalence of mitral valvar prolapse in a young population to be less than 1%, the prevalence being similar across both age and gender.

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