

Mitral Valve Prolapse and Athletic Participation in Children and Adolescents

Committee on Sports Medicine and Fitness

Mitral valve prolapse (MVP) is generally a benign condition characterized by the protrusion of the mitral valve leaflets into the left atrium during systole. The prevalence of MVP in individuals under the age of 18 years is estimated to be 5% but is higher in those with Marfan's syndrome and other collagen vascular disorders.¹ A midsystolic nonejection click with or without a late systolic murmur is the auscultatory hallmark of this syndrome. The diagnosis of MVP in children and adolescents should be based primarily on auscultatory findings and not on minor echocardiographic findings.¹

The prognosis in children and adolescents with isolated MVP appears to be excellent and complications are rare. In 553 children, aged 15 days to 18 years, who were involved in studies with a follow-up period of 6 to 9 years, the following were reported: subacute bacterial endocarditis (one case), cerebral vascular accidents (two cases), migraine headaches (four cases), and chest pain (12 cases).^{2,3} Only four cases of sudden death have been reported in patients younger than 20 years of age.¹⁻⁴

In a study of 103 patients with MVP, 16% were found to have premature ventricular beats during exercise electrocardiography (ECG) (exercise test).³ Thirty-eight percent were found to have premature ventricular contractions (PVCs) on 24-hour ECG (Holter) monitoring. This study, however, does not report the true prevalence of dysrhythmias because all these subjects had been referred to a pediatric cardiologist for evaluation. It is likely that these reported numbers are high because asymptomatic patients are less often referred.

In patients suspected of having MVP, a thorough medical history should include questions regarding the occurrence of near syncope, syncope, palpitations, or chest pain. Family history should be evaluated for the presence of sudden death or MVP in the family.

Patients suspected of having MVP should be examined sitting, standing, squatting, and supine to elicit the changes in the auscultatory findings with different body positions. Maneuvers such as squatting or hand-grip exercise tend to increase left

ventricular volume and decrease the degree of MVP and mitral regurgitation. (The click will move toward the second heart sound and the murmur will become softer.) Conversely, any maneuver that decreases left ventricular volume such as the Valsalva maneuver, sudden change from supine to sitting or sitting to standing, or inspiration, will increase the degree of MVP. (The click will move toward the first heart sound and the murmur will become louder and longer.)

If the patient is symptomatic (chest pain, dysrhythmias, palpitations, syncope, near syncope) or if the presence of mitral insufficiency is suspected (systolic murmur), the patient's condition should be evaluated further with a resting ECG, an echocardiogram, a 24-hour ECG (Holter) monitor, and an exercise ECG (exercise test). This evaluation may require referral to a cardiologist.

When the pediatrician diagnoses MVP in an asymptomatic child, it is important to explain to the parents and the patient that the finding is benign and in the majority of cases not associated with any problems or complications. This reassurance and education at the time that the diagnosis is made will prevent the common iatrogenic phenomenon of "cardiac non-disease."

RECOMMENDATIONS

The American Academy of Pediatrics recommends the following:

1. All *asymptomatic* patients with MVP in the absence of mitral insufficiency or a family history of sudden death associated with MVP may engage in all activities.
2. Patients with MVP who are symptomatic (chest pain, palpitations, dysrhythmias, near syncope, syncope) or who have mitral regurgitation should have their conditions further evaluated before they are cleared for athletic competition. This evaluation should include a resting ECG, an echocardiogram, a 24-hour ECG (Holter) monitor, and an exercise ECG (exercise test).⁵ Evaluation by a cardiologist is suggested.

This statement has been approved by the Council on Child and Adolescent Health.

The recommendations in this statement do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate.

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PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

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