

Aortic Elasticity and Carotis Intima Media Thickness in Children with Mitral Valve Prolapse

Gunay E.E., Ibis Z., Cevik S.B., Akalin F.

Marmara University Faculty of Medicine, Department of Pediatric Cardiology, Istanbul, Turkey

Introduction: Mitral valve prolapse (MVP) occurs due to proteoglycan accumulation, abnormal collagen composition, elastin fiber fragmentation which may also affect connective tissue and arterial wall. We investigated aortic elasticity, carotis intima-media thickness (CIMT) and their relation to joint hypermobility in patients with MVP.

Methods: The study included 41 MVP patients (mean age=13.4±3.9; median:14, range:5-20 years, male/female= 15/26) and 43 controls (mean age=12.8±3.4; median:13, range:6-19, male/female=15/28). Blood pressures, hypermobility scores were obtained; Philips IE33 Ecocardiography machine equipped with 5MHz and L-11 Mhz linear transducers were used for measuring LV diameters and functions, valve morphology, systolic and diastolic diameters of aortic annulus, sinus valsalva (SV), sinotubular junction (STJ), ascending, descending and abdominal aorta (AscAo, DescAo, AbdoAo) and CIMT. Z-scores, aortic strain, aortic distensibility (DI), aortic stiffness index (SI) were calculated.

Results: In patients with MVP, Z-scores of aorta at level of anulus, SV, STJ were higher than controls ($p=0.023$, $p=0.011$, $p=0.005$ respectively). Echocardiographic features; mitral anulus/m², LVds/ m², LVdd/ m² and mitral E were greater in MVP group ($p=0.001$, $p=0.004$, $p=0.022$, $p=0.008$, respectively). MVP group had higher Strain (%) and DI ($p=0.020$, 0.012 ; respectively) and lower SI in ascAo ($p=0.019$). Healthy children had higher CIMT than MVP patients ($p=0.020$). Leaflet thickness (LT) correlated to CIMT ($p=0.033$, $r:0.343$) and SI ($p=0.039$ $r:0.356$); but inversely correlated to strain and DI of SV ($p=0.015$, $r:-0.398$; $p=0.054$, $r:-0.333$ respectively). In both MVP and control groups, CIMT correlated to SI of SV ($p=0.001$, $r=0.54$; $p=0.007$, $r:0.47$ respectively) and inversely correlated to strain and DI of SV ($p=0.005$, $r=-0.47$; $p=0.001$, $r=-0.49$). Patients with LT greater than 5 mm had higher CIMT ($p=0.035$). Hypermobility score were slightly higher in MVP patients ($p=0.056$) and correlated to DI and strain of DescAo ($p=0.002$, $r=-0.50$; $p=0.020$, $r=-0.43$) and DI AbdoAo ($p=0.020$, $r=-0.39$).

Conclusions: Patients with MVP had larger aortic root and more distensible AscAo which may be related to the structure of aortic wall. Hypermobility inversely correlated to distensibility of DescAo and AbdoAo probably due to conduit-like behavior of aorta. The increase in CIMT and SI of ascAo with the increase in LT may warn about future risks for atherosclerosis.