

The aim of the study is to characterise the prevalence and echocardiographic (EchoCG) features of aortic valve stenosis (AVS) and to evaluate the associations of aortic valve area (AVA) with lipoprotein(a) (Lp(a)), the heart failure (HF) biomarker NT-proBNP and atrial fibrillation (AF) in an adult population.

Methods. We used data from the “Know your heart study” with a cross-sectional design, which included 2380 participants aged 35–69 years, recruited in 2015–2017. In 2328 respondents, the following were determined by EchoCG: mean pressure gradient (G_{mean}), mmHg, peak aortic blood flow velocity (V_{max}), m/s. The presence of AS was confirmed by a ≥ 15 mmHg and a V_{max} at the valve ≥ 2.5 m/s. In 2105 participants, AVA, cm² and the prevalence of severe AVS were determined by the continuous flow equation according to the criteria: AVA ≤ 1.0 cm² and indexed AVA (iAVA) ≤ 0.6 cm²/m². Subtypes of AVS — high-gradient (HG) and low-gradient (LG) were distinguished according to EACI and ASE (2017) criteria.

Structural and functional EchoCG parameters of the heart, disease history, biomarkers (troponin T, N-terminal prohormone of brain natriuretic peptide (NT-proBNP), Lp(a)) were used in the analysis.

Results. The prevalence of high gradient aortic valve stenosis (HGAVS) (G_{mean} ≥ 15 mmHg) was 0.43 % (n=10), 0.2 % aged 40–59 years and 1.1 % aged 60–69 years (p=0.007); 0.6 % in men and 0.3 % in women. The prevalence of severe low gradient aortic valve stenosis (LGAVS) was 0.9 % (n=18, 61 % men) and all had a left ventricular ejection fraction (LVEF) > 50 %. The formation of concentric LV remodelling was detected in those with HGAVS, and the predominance of diastolic dysfunction was found in those with severe LGAVS. AVA value was associated with male gender ($\beta=0.383$, p<0.001), age ($\beta=-0.097$, p<0.001) and Lp(a) ($\beta=-0.048$, p=0.018). In patients with severe LGAVS, NT-proBNP levels were Me 158.4 (105.4; 260.8) pg/ml and were higher than those without AVS (p=0.005). NT-proBNP correlated with iAVA and AF correlated with age, HF and AVA.

Conclusion. The prevalence of mild to moderately severe HGAVS according to echocardiography in the population was 0.2 % at the age of 40–59 years and 1.1 % at the age 60–69 years. Severe LGAVS occurred in 0.9 % of participants. AVA was negatively associated with Lp(a) when corrected for sex and age. NT-proBNP and AF were associated with AVA when corrected for HF, age and sex.