Coincidence of Secondary Cardiac Alterations with Subtypes of Isolated Aortic Valve Stenosis

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Methods

Whereas combination In NFLG LFLG study 13 secondary patients mPG equation) 320 alterations groups 50 40. Inclusion on HG of 97 (mean divided AS mPG 40mmHg), high gradient AS (mPG ≥ 40mmHg). In addition, patients were divided according to their indexed stroke volume (SVI) into low (LF- AS; SVI ≤ 35ml/m²) and normal flow AS (NF-AS; SVI > 35ml/m²).

Secondary cardiac alterations, e.g. relative wall thickness (RWT), E/E’ and systolic pulmonary artery pressure (sPAP) were determined as surrogate parameters for left ventricular hypertrophy (LVH), left ventricular end-diastolic pressure (LVEDP) and secondary pulmonary arterial hypertension in relation to AS subtypes depending on mPG and left ventricular SV. Echocardiographic parameters for secondary cardiac alterations were defined as pathological if RWT ≥ 0.43, E/E’ > 13 and sPAP > 30mmHg.

Results

LFLG-AS (n=135; mean mPG = 21.12 ± 8.87; mean SVI = 26.10 ± 5.11), NFLG-AS (n=97; mean mPG = 29.03 ± 7.02; mean SVI = 43.05 ± 6.65), LFHFLG-AS (n=21; mean mPG = 49.79 ± 7.57; mean SVI = 28.16 ± 4.56) and NFHFLG-AS (n=47; mean mPG = 52.28 ± 12.71; mean SVI = 45.45 ± 7.51).

In all patients with isolated severe AS at least one of the secondary cardiac alterations was observed. A pathological RWT was documented in 94%, an increased E/E’ in 76% and an increased sPAP in 79% of all patients. In case of two (three) secondary cardiac alterations RWT and sPAP were the most common combination, followed by RWT and E/E’ (39%). In > 50% of the patients RWT, E/E’ and sPAP were in pathological ranges.

The prevalence of a pathological RWT was significantly different between LF-AS and NFHFLG-AS (LFLG-AS vs. NFHFLG-AS (p=0.02); (LFHFLG-AS vs. NFHFLG-AS (p=0.01)), whereas the prevalence of increased E/E’ was significant higher (p = 0.03) in LF-AS groups than in NF-AS groups. sPAP showed a significantly higher prevalence (p = 0.02) in HG-AS groups than in LG-AS groups.

Conclusion

In all patients with isolated severe AS - defined by EOAV < 1cm² or AVmax > 4m/s - at least one of the parameters RWT, E/E’ and sPAP was increased and in > 50% of the patients all parameters were in pathological ranges. Thus, the echocardiographic assessment of these secondary cardiac alterations might be of additional value in AS patients to underline the diagnosis of a suspected severe AS. The present study sets the stage for follow up studies to determine the prognostic importance of the combination of these echocardiographic parameters in severe AS.

Purpose

The grading of the severity of aortic valve stenosis (AS) is important for the prognosis and for the time point of treatment. Echocardiographic parameters, e.g., transvalvular velocity, mean pressure gradient (mPG) and effective orifice area (EOA) can be incongruent, especially in AS with different flow conditions. Therefore, the aim of the present study was to analyze the prevalence of secondary cardiac alterations in patients with isolated severe AS and their importance for diagnostic accuracy of severe AS.