OBJECTIVES: To evaluate the role of contrast Doppler echocardiography in the assessment of aortic stenosis severity, in comparison with the conventional method and using the catheterization study as the gold standard.

STUDY DESIGN: Prospective comparative study.

SETTING: Echocardiography Laboratory of Cardiology Department.

POPULATION: We included 36 consecutive patients, 20 male, aged 67 +/- 11 years, referred for catheterization study to evaluate aortic stenosis severity.

METHODS: All patients underwent conventional and contrast Doppler echocardiography and catheterization study. For contrast Doppler, we used Levovist (300 mg/ml infusion). We analyzed the following echocardiographic parameters: a) left ventricle dimensions, wall thickness and function; b) aortic valve morphology; c) post-stenotic aortic valve flow--peak velocity, velocity-time integral, peak gradient, mean gradient; d) left ventricle outflow tract flow--peak velocity, velocity-time integral; e) aortic valve functional area; f) acquisition time and Doppler signal intensity for post-stenotic aortic valve flow. Catheterization parameters analyzed: a) peak aortic valve gradient; b) mean aortic valve gradient.

RESULTS: Contrast Doppler yielded higher peak gradients than conventional Doppler (85.6 +/- 30.2 vs 72.6 +/- 26.1 mmHg, p < 0.001), as well as higher mean gradients (51.4 +/- 19.0 vs 44.2 +/- 15.9 mmHg, p < 0.001). Peak gradients obtained with contrast Doppler correlated with those obtained invasively (r = 0.88, p < 0.001), although the values were higher (85.6 +/- 30.2 vs 73.6 +/- 32.0 mmHg, p < 0.001). There was no difference between mean contrast Doppler gradients and mean catheterization gradients, which showed a high correlation (r = 0.89, p < 0.001). There was no difference between peak and mean gradients obtained by conventional Doppler and invasively, which yielded correlations of 0.73 and 0.75, respectively (p < 0.001). The sensitivity of contrast Doppler for detection of severe aortic stenosis was 100% for peak gradient and 84% for mean gradient.
The specificity of contrast Doppler was 65% for peak gradient and 88% for mean gradient, while for conventional Doppler it was, respectively, 58% and 88%. Acquisition time for aortic flow visualization was lower (p < 0.001) and flow intensity higher for contrast Doppler, in comparison with conventional Doppler.

**CONCLUSIONS:** In this study, contrast Doppler yielded high correlations with invasive data and higher sensitivity and specificity for detection of severe aortic stenosis than conventional Doppler. It is a useful method for evaluation of aortic stenosis severity.