

Summary

Background:

Calcific aortic stenosis is the most frequent and most frequently operated valvular disease. Currently, there is no known medical treatment to slow the progression of the disease. The aim of our study was first, to assess predictors of the progression of the aortic valve calcification, and second, to assess the association of the progression of aortic stenosis with the bisphosphonate treatment.

Methods:

Part I - prospective follow-up of consecutive patients with coronary artery disease associated with aortic stenosis (mean transvalvular aortic gradient of 30 mmHg or greater), aortic sclerosis or normal aortic valve were prospectively identified. Clinical, laboratory, echocardiographic, angiographic and calcium score evaluation using multidetector computer tomography at baseline, and at the end of the study. Predictor of calcification were sought using multivariate regression.

Part II - pilot retrospective study of patients with aortic stenosis and two echocardiographies >8 months apart. The patients were divided into those treated with bisphosphonates for osteoporosis and those not treated. We compared the annualized gradient change between the groups and identified predictors of AS progression.

Results:

Part I 294 patients were prospectively enrolled, with mean follow-up 30 ± 11 months. The main result: We found higher increase of valvular calcium volume in patients with aortic sclerosis vs. initially normal aortic valve (mean calcium volume change per year 5 ± 11 vs. 19 ± 36 ml, $p=0,008$). The baseline valve calcium volume was the only independent predictor of calcification progression β coefficient 0,05 (95% confidence interval 0,03-0,06) $p<0,001$. Association of the calcification progression with vitamin D, PTH or lipid and glucose metabolism parameters was not found.

Part II 103 patients were enrolled (51% women, age 68 ± 10 years), of these 28(27%) were treated with bisphosphonates. The mean interval between initial and final follow-up was 29 ± 13 months. The bisphosphonate treatment was identified as an independent predictor of mild aortic stenosis progression. β coefficient -2,36 (95% confidence interval -4,47 až -0,26) $p=0,028$.

Conclusions:

The baseline valve calcium volume was the only independent predictor of calcification progression. Bisphosphonate treatment was independently associated with slower progression of mild AS in patients with preserved renal function. Our results suggest a favorable inverse association between osteoporosis treatment and progression of calcific aortic stenosis and deserve further evaluation in a prospective study.