IX Streszczenie w języku angielskim

Introduction

The greatest challenges of modern cardiology are: coronary artery disease (CAD), heart failure and valvular heart disease (VHD). These diseases often coexist with each other, presenting a significant clinical problem that affects patient prognosis.

Aim

Evaluation of the prevalence and severity of CAD in patients with VHD. To analyze the influence of CAD risk factors, comorbidities, and treatment modalities on long-term prognosis depending on the type of valvular defect and severity of atherosclerotic lesions in the coronary arteries.

Material and methods

Out of 36941 patients treated in the Department of Invasive Cardiology with Cardiac Intensive Care Unit and Catheterization Laboratory of the University Clinical Hospital (USK) in Bialystok between 2006 and 2016, the group of 2589 patients with VHD were retrospectively and prospectively analyzed. Inclusion criteria for the study were: the presence of an acquired valvular heart disease of moderate or severe stage involving the aortic and/or mitral valves and angiographic diagnostics of coronary arteries performed. The exclusion criterion was a history of surgical treatment of VHD. Based on the echocardiographic picture patients were divided into isolated valvular defects and multivalvular and mixed heart defects (MVHD). Three subgroups were identified in the study population based on coronary arteries angiographic images: 1) patients with significant atherosclerotic lesions - obstructive CAD, 2) patients with non-significant atherosclerotic lesions - non-obstructive CAD, and 3) patients without atherosclerotic lesions in the coronary arteries. The two-stage follow-up study at first evaluated the applied interventional and surgical treatment at USK in Bialystok, and then evaluated the total mortality as of 16/05/2019. The mean follow-up time was 1861 days (SD=1243), median 1709 days (Q_1=946 days, Q_3=2711 days). The study was approved by the Bioethics Committee of the Medical University of Bialystok. The following tests were used in the statistical analysis: chi^2, Student's t-test, Mann-Whitney and Kruskal-Wallis with the Dwass-Steel-Critchlow-Fligner post hoc test. Wald's backward elimination logistic regression was used to assess risk factors for the diagnosis of obstructive CAD or risk factors for death.

Results

The group of 2589 patients with acquired VHD met the inclusion criteria. The majority of them were male (56.55%, N=1464) with a mean age of 69.69 years (SD=10.68). The most common valvular defects were mitral regurgitation (MVI, 43.99%, N=1139) and aortic stenosis (AVS, 23.79%, N=616).

Patients with obstructive CAD made up the most numerous subgroup (52.96%, N=1371), had a higher proportion of men (61.2% vs. 44.77%, P<0.001) and were 10 years older (mean age 72.62 years, SD=9.45 vs. 61.99 years, SD=11.56, P<0.001) than patients without atherosclerotic lesions in the coronary arteries. The group of patients with obstructive CAD had a higher prevalence of cardiovascular risk factors and comorbidities such as: hypertension (74.33%, N=1019), hyperlipidemia (71.33%, N=978), type 2 diabetes (28.59%, N=392), chronic kidney disease (43.98%, N=603), and heart failure (66.17%, N=880) compared with the other groups (P<0.001). Patients with non-obstructive CAD had the highest incidence rate of atrial fibrillation (45%, N=333).

Patients with obstructive CAD made up the majority of the isolated MVI group (61.81%, N=704), whereas only 15% (N=6) of patients with isolated MVS. Single-vessel CAD occurred in similar percentages in isolated AVS, AVI, and MVI. Multivessel CAD was most commonly observed in the population with isolated MVI (27.39%, N=312). One in five patients in the study population had a history of an acute coronary syndrome (ACS). The highest incidence rate of prior ACS was characterized by patients with isolated MVI (27.04%, N=308) and the lowest incidence rate by patients with isolated MVS (2.5%, N=1).

During the study, 29.08% (N=753) of patients underwent percutaneous coronary angioplasty, most commonly in the LAD, RCA, and Cx. In the group of patients with severe VHD, surgery was performed in the highest percentage in patients with AVI (86.21%, N=50) and AVS (79.46%, N=356), and in the lowest percentage in the group with MVI (43.28%, N=161). Transcatheter aortic valve implantation procedure was performed in 10.55% (N=65) of patients with isolated AVS.

During follow-up, 43.88% (N=1136) of study patients died. The severity of atherosclerotic lesions in the coronary arteries affected the mortality rate in all valvular defect groups, except for patients with MVS. In the MVHD group, 63.67% (N=163) of patients with obstructive and 42.78% (N=80) with non-obstructive CAD died. In the isolated VHD groups, the highest mortality rate was in patients with severe MVI and obstructive CAD (61.42%, N=121).

Independent factors increasing the risk of death in patients in the overall study population were: male sex (OR=1.064, 95% CI 1.010-1.121), age (OR=1.206, 95% CI 1.136-1.280), presence of atrial fibrillation (OR=1.073, 95% CI 1.019-1.129), chronic kidney disease (OR=1.194, 95% CI 1.134-1.257), severe AVS (OR=1.171, 95% CI 1.103-1.244), severe MVI (OR=1.059, 95% CI 1.004-1.116), MVHD (OR=1.093, 95% CI 1.039-1.149), and obstructive CAD (OR=1.139, 95% CI 1.080-1.201). Undergoing cardiac surgery during follow-up (OR=0.905 95% CI 0.852-0.962) and higher left ventricular ejection fraction (OR=0.803 95% CI 0.759-0.849) reduced the risk of death in long-term prognosis in patients in the overall study population. Based on Kaplan-Meier curves, patients without CAD had better survival rates in contrast to patients with obstructive CAD.

Conclusions

1) Coronary artery disease with significant atherosclerotic lesions in the coronary arteries was found in half of the study population, and one in five patients had a history of acute coronary syndrome. The most frequently chronic and acute coronary syndromes were observed in patients with mitral regurgitation, which was also the most common isolated valvular defect.

2) The prevalence of comorbidities in each group of valvular heart defects corresponded with the severity of atherosclerosis in the coronary arteries.

3) The long-term prognosis of patients with valvular heart disease was inversely related to the severity of atherosclerotic lesions in the coronary arteries, and cardiac surgery was an independent factor reducing mortality in the overall study population.

4) Patients with isolated heart defects made up the majority of the study population. The highest mortality rate and the lowest rate of cardiac surgery were found in patients with isolated severe mitral regurgitation and obstructive coronary artery disease.

5) One in five patients had multivalvular and mixed heart defects. This was the group with the poorest prognosis, with two-thirds of patients with obstructive coronary artery disease dying during follow-up. In the group with non-obstructive coronary disease mortality was reduced to the percentage similar to the overall study population.