Editorial

Valvular Index and Valvular Score. A New Approach for the Follow-Up of the Natural History of Valvular Heart Disease

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Data from the history, physical examination, and laboratory examination qualify and quantify the pathologic *continuum* triggered by valvular lesion. Following up a patient with valvular heart disease, who usually has a long history, is building a *pari-passu* of comparisons. Three types of observations are used in our every day practice: 1) to observe cardiovascular adaptation, including prevention of the valvular pathogenic factors (rheumatic fever or infective endocarditis); 2) interventions in events that modify the natural history (recurrent attack of rheumatic fever, infective endocarditis, pregnancy); 3) replacement of the natural history by a postoperative history.

Each moment of the valvular assessment is a link between the past steps and predictions of the following pattern. There is the time when the physical manifestation is just a "murmur," and an observation period of the natural history is recommended; there is the time when severe valvular lesion is present and the patient remains with a good quality of life; there is the time when the patient is considered "sick indeed" because of the onset of symptoms; there is the time that goes beyond the natural history and the cardiologist is expected to recommend intervention on the anatomy of the heart disease [1,2].

From the practical point of view, to follow up a patient with valvular heart disease is to accumulate answers about 4 factors, each one symbolized by a letter: 1) how severe is the lesion (V); 2) what is the effect on myocardial function (M); 3) what is the level of the coronary artery obstruction (C) 4) what is the effect on the level of pulmonary artery pressure (P).

We understand that gathering 4 answers under the acronym VMCP helps in characterizing the clinical moment and communication between appointments, and we are proposing a 4 x 4 classification, including the 4 variables, each of them with 4 categories. VMCP represents the *valvular index* (ex, $V_3M_2C_1P_2$) and gives grounds to the *valvular score* ($3+ 2 + 1 + 2 = 8$ in the case mentioned) (chart 1).

Our intention is to define the subdivision in categories based on the reference points usually used. Thus, the passage from V2 to V3 includes the case in class I of surgical recommendation according to the guidelines[1]. The identification of the case as M3 or M4 implies an influence on the surgical prognosis.

VMCP score was applied in 608 patients with valvular heart disease undergoing surgical treatment between January/2002 to March/2003 at our institution. The mean age was 48.9 ± 17 years, 55.3% were female, and 58.7% had a rheumatic cause.

The group with VMCP >8 had a longer hospital stay than did the group with scores lower than or equal to this value (26.6 ± 23.1 vs. 20.9 ± 18.7 days, P=0.006) and greater hospitalization at postoperative ICU (8.8 ± 19.4 vs. 5.25 ± 8.97 days, P=0.029).

Univariate analysis for mortality demonstrated as important: age (P=0.005, *odds ratio* (OR) =1.03), diabetes (P=0.001, OR=1.7), history of renal failure (P=0.0001, OR=9.1), previous hospitalization due to heart failure (HF) (P=0.001, OR=8.9), reoperation (P=0.0009, OR=3.22) and VMCP score > 8 (P=0.001, OR=3.0). After multivariate analysis, VMCP remained associated with mortality (P=0.034, OR=1.33) after the adjustment for age, reoperation, DM, renal failure, and hospitalization due to HF.

Regarding hospitalization, the univariate analysis demonstrated that, when longer than 10 days, it was associated with smoking

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Chart 1 - Systematization of the VMCP valvular index

V - valve or prostheses	M - myocardium	C - coronary artery	P - pulmonary artery systolic pressure (on echocardiography)
V1 - Mild valvular lesion	M1 - Ejection fraction > 60%	C1 - Normal coronary arteries or no information	P1 - PAP < 30 mm Hg
V2 - Asymptomatic severe valvular lesion	M2 - Ejection fraction between 60% and 50%	C2 - Coronary obstructions up to 60%	P2 - PAP between 30 and 60 mm Hg
V3 - Symptomatic lesion in one valve	M3 - Ejection fraction between 50% and 30%	C3 - Critical coronary obstruction in one artery	P3 - PAP between 60 and 100 mm Hg
V4 - Symptomatic lesion in several valves	M4 - Ejection fraction <30%	C4 - Critical coronary obstructions in several arteries	P4 - PAP > 100mm Hg

(P=0.03, OR=1.8), presence of atrial fibrillation (P=0.003, OR=2.1), and VMCP index > 8 (P=0.01, OR=1.7). After multivariate analysis, VMCP index higher than 8 was still associated with hospitalization longer than 10 days (P=0.02, OR=1.3) after adjusting for smoking and the presence of atrial fibrillation.

When we adopted the value of 8 as a cutpoint for the valvular score, we obtained 84% specificity, with an 81% negative predictive value for hospitalization longer than 10 days. Patients with a valvular score greater than 8 were associated with greater immediate surgical mortality (P=0.006).

References

1. American College of Cardiology/American Heart Association. Guidelines for the management of patients with valvular heart disease. Circulation 1998;98:1949-84

2. Edwards FH, Peterson ED, Coombs LP et al. Prediction of operative mortality after valve replacement surgery. J Am Coll Cardiol 2001; 37:691-974.