Clinical and echocardiographic trends in percutaneous balloon mitral valvuloplasty

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Background: The prevalence of Rheumatic Mitral Stenosis (MS) has significantly changed over the last decades. We intend to examine patient demographics, Echocardiographic characteristics, procedural success rates, and complications throughout 30-years.

Methods: We conducted a single-center descriptive observational study. The study population consists of patients undergone percutaneous balloon mitral valvuloplasty (PBMV) at Emek Medical Center in Israel from January 1990 to May 2019.

Results: Four hundred seventeen patients underwent PBMV during the study period and were eligible for the study. Age did not change significantly over time (p=0.09). The prevalence of Male and patients who were smoking and had multiple comorbidities such as hypertension, dyslipidemia, ischemic heart disease, and chronic kidney disease became increases over time (p=0.02, p=0.02, p=0.001, p=0.01, p=0.02, and p=0.001, respectively). Wilkins score and all its components increased over time, and the total score was higher in females (p=0.01). Seventy-nine (18.9%) patients had complications. The rate of complications did not change over decades. Patients with Wilkins score >8, post-procedural MR of ≥2, and post-procedural MVA <1.5 had the highest risk for the need of Mitral valve replacement (MVR) surgery in 2 years following PBMV (3.64, 4.03, 2.44, respectively, CI 95%, p<.0001 for all). The median time in these patients was 630 days compared to 4–5 years in the entire population. Patients with Post-procedural MR of ≥2 and post-procedural MVA <1.5 had ten times risk for developing heart failure (HR 9.07 and 10.06, respectively, CI 95%, P<.0001)

Conclusion: Our research reveals trends over time in patients' characteristics and echocardiographic features. Our study population consists of more male patients with multiple comorbidities and more complex and calcified valvular structures in the last decade. Wilkins score >8, post-procedural MR of ≥2, and post-procedural MVA <1.5 cm^2 were independed predictors for the time for surgery and heart failure hospitalization.

Table 5. The two-years Hazard ratio for the need of mitral valve surgery, Heart failure hospitalization events, and composite endpoints[¥] among the study population

Characteristics [N]	*HR for MVR surgery [CI %95%]*	*HR for HF hospitalization [CI %95%]*	*HR for Composite Endpoints [¥] [CI %95%]*	*P-value*
Wilkins Score >8	3.648 [2.34-5.68]	2.724 [1.76-4.21]	2.330 [1.57-3.45]	<.0001
Post-Procedural MR ≥ 2	4.03 [2.05-7.92]	9.07 [4.73-17.38]	3.127 [1.63-5.96]	<.0001
Post-Procedural MVA < 1.5	2.44 [1.63-3.64]	10.06 [6.89-14.51]	2.33 [1.62-3.35]	<.0001

HR, Hazard ratio; HF, heart failure

[¥] 2-years composite endpoints for Heart Failure hospitalization, Mitral Valve Surgery, and worsening functional capacity (assessed by the New York Heart Association classification).

Figure 4. Kaplan-Meier curve of Time to Heart failure hospitalization among three-defined groups.