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The Prevalence of PPM (Prosthetic –Patient Mismatch) after AVR (Aortic Valve Replacement) in Military Cardiac Center b/w Jan 2015-till June 18

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Abstract

Background

Rahimtoola defined PPM as a condition that occurs when the valve area of a prosthetic valve is lessthan the area of the patient' normal valve. PPM is defined as an EOA indexed for body surface area < 0.8-0.9 cm2/m2 in the aortic position and < 1.2-1.3 cm2/m2 in the mitral position. (14,15,16)

Objectives: *To Evaluate the Prevalence of PPM (Prosthetic –Patient Mismatch) of patients undergoingAortic Valve Replacement in Military Cardiac Center*

Materials and Methods: *A retrospective analysis of AVR procedures at a single centre over 3years was conducted.*

Statistical Analysis Used: *Independent t-test, chi-square test.*

Results: *106 Patients with Complete, data were analyzed for PPM. The incidence of PPM was 9.5% (10). There was no impact of PPM on all-cause in-hospital mortality.*

Conclusion: *PPM has lower incidence after AVR in this Yemen population and does not increase early in Hospital mortality.*

Key words: *PPM In Military Cardiac Center, Yemen.*

Background

The concept of patient-prosthetic mismatch (PPM) was first described by Rahimtoola et al. in 1978 **[**1**]**. In the aortic position, it occurs when there is an excessive trans-valvular gradient across a normally functioning prosthetic valve to generate an adequate cardiac output. Since then there have been numerous publications describing the prevalence and clinical consequences of PPM. The evidence thus far has been conflicting with several studies reporting higher mortality and increased incidence of re-operations associated with PPM **[**2–7**]**, whereas others have shown no clinical relevance of PPM **[**8–13**]**

Definition of Patient Prosthesis Mismatch

Most widely accepted parameters for defining PPM is indexed EOA which is EOA divided by patients BSA.3,4 Gradients increase exponentially when indexed EOA is 0.8 to 0.9 cm2 /m2 (►Fig. 1). Obese patients tend to have lower cardiac output requirements for similar BSA. Indexed EOA may

overestimate severity of PPM in obese patients (body mass index **[**BMI**]** ¼ 30 kg/m2). European Association of Cardiovascular Imaging and Valve Academics recommend using lower cut-off points of indexed EOA in obese patients. EOA less than 0.70 cm2 /m2 reflects moderate PPM and < 0.55 cm2 /m2 reflects severe PPM. (14.15)

Rahimtoola defined PPM as a condition that occurs when the valve area of a prosthetic valve is less than the area of the patient' normal valve. . PPM is defined as an EOA indexed for body surface area < 0.8-0.9 cm2/m2 in the aortic position and < 1.2-1.3 cm2/m2 in the mitral position. (14,15,16)

	Mild or Not Clinically Significant, cm^2/m^2	Moderate, cm^2/m^2	Severe, cm^2/m^2
Aortic position	>0.85 (0.8–0.9)	≤0.85 (0.8–0.9)	≤0.65 (0.6–0.7)
Mitral position	>1.2 (1.2–1.3)	≤1.2 (1.2–1.3)	≤0.9 (0.9)

Fig. 1 Exponential increase of gradients with indexed effective orifice area (EOA).

Study design Objective:

- To Evaluate The Prevalence of PPM (Prosthetic –Patient Mismatch) of Patients undergoing Aortic Valve Replacement in Military Cardiac Center.

Material and Methods

Retrospective Descriptive study (A total of 110 patients were selected from Military Cardiac Center b/w Jan 2015-JUNE 2018)

Inclusion Criteria

All Isolated & concomitant (DVR) Elective AVR patients between

Jan 2015- JUNE 2018, which had been done by our surgical team on standard CPB with crystalloid and blood cardioplegia.

Exclusion Criteria

- Redo
- Concomitant heart disease (cabg & valve Surgery)
- Emergent. Valvular Surgery
- ISOLATED MVR

Material and Methods

A retrospective analysis of AVR procedures at a single centre over 3years was conducted.

Descriptive statistics were presented through figures and tables and t-test was used to analyze the continuous variables. all the statistical analysis were performed using the SPSS statistical software (version 15.0). Besides, $P<0.05$ was considered as statistically significant.

COMPARISON B/W PPM& NON PPM GROUP

VARIABLES	PPM %	NO PPM %
NO OF PTS	9.5	90.5
MALE	70	61.5
FEMALE	30	38.5
ISOLATED AVR	80	22.9
concomitant AVR	20	77.1
AV-PVL	10	9.3
MV-PVL	10	2
LVH	20	42.7
SMOKING	0	17.7
HYPERTENSION	40	8.3
DIABETES	0	1

Table :1

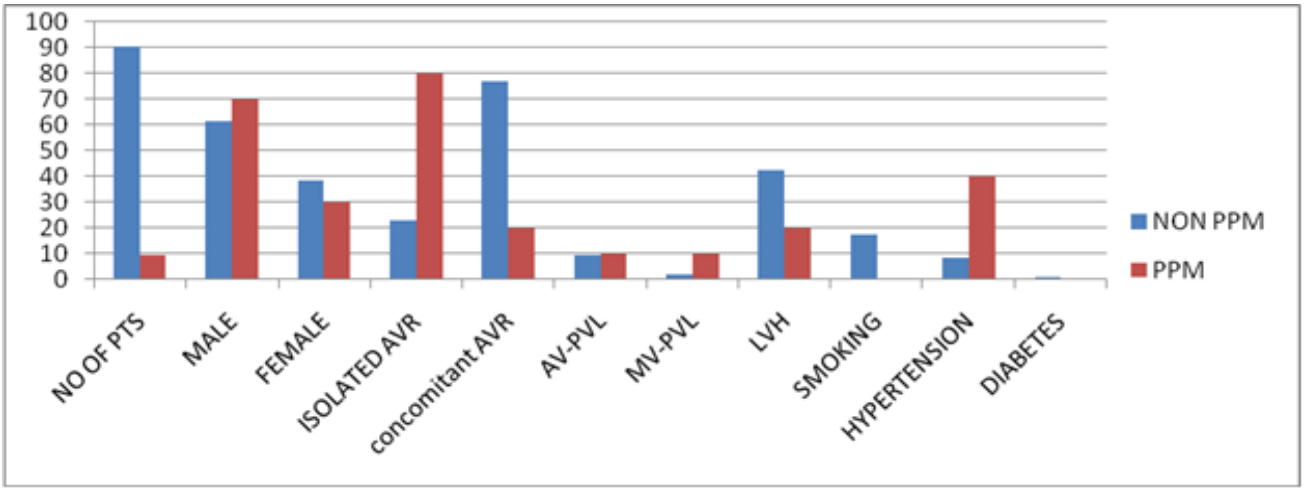

Figure: 2

The Incidence of mild to moderate PPM in our Study was 9.5% and the Severe PPM was 0.0% .we compared with other country ,table 3.figure 3

COUNTRY	MILD-MODERATE PPM	SEVERE PPM
YEMEN	10/106 (9.5%)	0/10(0.0%)
INDIA	76/768 (9.8%)	3/768(0.5%)
CANADA	55/606 (9.0%)	10/606 (1.6%)
CHINA	138/869(15.9%)	4/869(0,5%)

Table 02

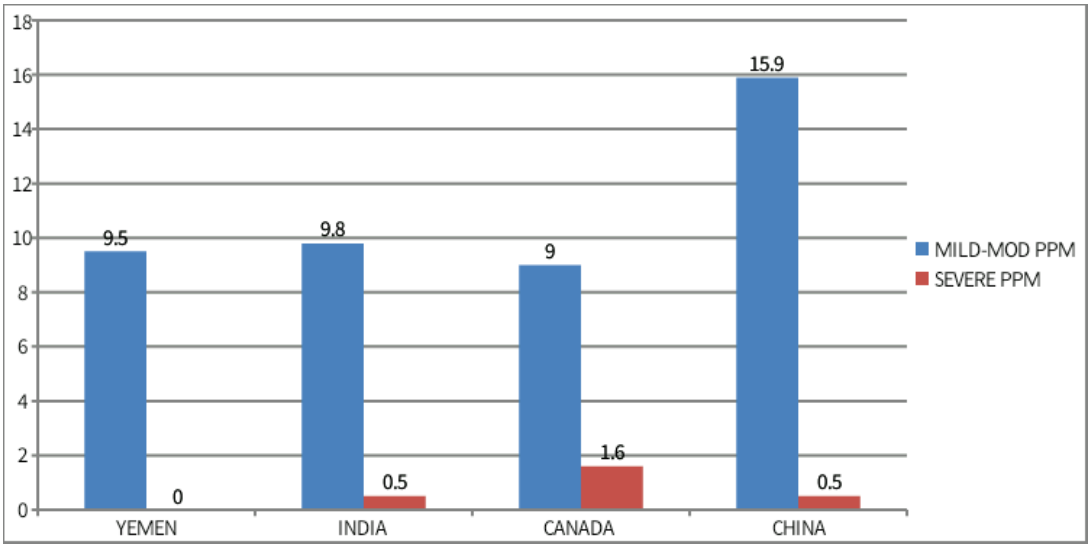

Figure 03

Discussion

The incidence of PPM in the present STUDY was 9.5% , but without any incidence of severe PPM. Isolated AS was associated with a significantly higher incidence of PPM, BSA and preoperative HTN had a good predictive ability toward PPM.

There has been awareness on PPM as a clinical entity and its impact on short and long-term outcomes after AVR after Rahimatoola's first description of this entity.**[**1**]** The impact of PPM is huge. To enumerate a few, higher gradients, persistent LVH, decreased postoperative cardiac index, decreased the quality of life. Aortic root enlargement (ARE) procedures are used to prevent PPM in smaller aortic annuli. Most of these techniques demand skill and are associated with complications including longer CPB and cross -clamp times, increased rates of reoperations for bleeding, and increased operative mortality. **[**9,10**]** Moreover, the risk- benefit ratio of ARE procedures to avoid PPM is unclear.**[**10**]**

The incidence of PPM in the present cohort is less than most other observations.**[**11**]** Aortic annulus diameters are an essential factor for PPM occurrence. The need to index aortic annulus to BSA is essential due to the obvious differences in anthropometry of subjects of across varied origins. iAA was observed to be different for western reference subjects to Indian subjects as studied by Rajendran et al. **[**12**]**

The Incidence of PPM was lower in our population, and was higher in Isolated AS as compared to Concomitant AS group. also high in male than female and HTN Patients (Table 3 & figure1)

In this study, there has been no association of PPM with in-hospital mortality). Urso et al. in their meta-analysis highlighted that only severe PPM was associated with an increased early mortality.**[**22**]** They also highlighted an absence of association between moderate or mild PPM with early mortality except in patients with poor EF. The little number of patients in our study is probably one of the reasons why there is no incidence of severe PPM, as well as the lack of the lack of association with in hospital mortality.

Conclusion

PPM has lower incidence after AVR in this Yemeni population, with was higher incidence in isolated AVR than concomitant AVR and was not associated with increases perioperative mortality.

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