

INPLASY PROTOCOL

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None declared.

Gender-related differences on outcome following transcatheter mitral valve repair(TMVR)-a systematic review and meta-analysis

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Review question / Objective: **P:** Patients with transcatheter mitral valve repair (TMVR). **I/C:** Compare the effect of gender difference on the prognosis of transcatheter mitral valve repair. **O:**All-cause mortality (≤ 30 days), mitral regurgitation grade 1-2 (after 1 year), Hospitalization hemorrhage, Stroke (≤ 30 days), Acute Kidney Injury (≤ 30 days), Myocardial Infarction (≤ 1 year), Grade of cardiac function ($\leq II$), Number of days in hospital, Long-term mortality. **S:** cohort study. **Objective:** We conducted a systematic review and meta-analysis to assess whether gender differences have a significant effect on transcatheter mitral valve repair and to provide a reference for clinical treatment choice.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 April 2021 and was last updated on 21 April 2021 (registration number INPLASY202140110).

INTRODUCTION

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cause mortality (≤ 30 days), mitral regurgitation grade 1-2 (after 1 year), Hospitalization hemorrhage, Stroke (≤ 30 days), Acute Kidney Injury (≤ 30 days), Myocardial Infarction (≤ 1 year), Grade of cardiac function ($\leq II$), Number of days in hospital, Long-term mortality. **S:** cohort

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Rationale: Men and women have differences in pathophysiology, anatomical structure as well as the incidences of many basic diseases. Men and women patients also have differences in MR. Compared with men patients, women patients have smaller left atrial volumes, ventricular volumes and absolute regurgitation. When body size is taken as an indicator, the difference in heart size and regurgitation volume can be significantly reduced. Studies have shown that mitral valve surgery is beneficial for men. It has been reported that left ventricle reversal restructure after TMVR affects both men and women, and has been identified as an important prognostic factor. There was a significant difference in the proportion of men and women patients undergoing TMVR, with women patients accounting for 41%. Preoperative and postoperative conditions of men and women patients are different. In recent years, more and more studies have reported pro and postoperative conditions of TMVR based on gender differences. For TMVR, its has a bright future and there was not a systematic analysis of whether gender differences has an impact on the prognosis of TMVR.

Condition being studied: Mitral valve regurgitation (MR) is a common heart valvular disease, ranking first and second in the United States and Europe respectively. According to Olmsted County in the United States, the overall population prevalence of MR from 2000 to 2010 was 0.46%, which increased with age. The prevalence rate of severe MR in 65-74 years old was 0.5%, and that over 75 years old was about 1%. D'Arcy JL showed that the rate of new diagnosis of MR (moderate or above) in people over 65 years old was 2.3%, which was much higher than that of aortic stenosis (0.7%) . MR progresses in a concealed way, and serious consequences

occur when it develops to decompensation of left ventricle function. Moderate to severe MR is an important cause of heart failure. MR includes primary MR caused by mitral valve disease and secondary MR caused by left ventricular function changes. Asymptomatic primary symptoms of heart failure and left ventricular function in patients with severe MR insufficiency (ejection fraction $\leq 60\%$) and left ventricular expansion (left ventricular end systolic diameter ≤ 45 mm) is a indication for mitral valve repair (surgical or transtheter repair). Surgery repair preferred the first choice for MR, was once the gold standard of MR III - IV level repair, while some cases do not conform to its indications. Mortality of high-risk patients treated Surgery repair was about 25%. Transtheter mitral valve repair (TMVR) can be used as one of the alternative treatment methods. In 2012, the European valve guidelines for disease first used TMVR for high-risk populations who cannot tolerate surgery repair. Degenerative MR, secondary MR and poor pharmacological response were its major indications. The latest American valve guidelines recommended transcatheter edge to edge repair as IIA indications in the treatment of MR. MitraClip is the most commonly used repair system and the only one certified by the US Food and Drug Administration (FDA), which has been proved to be safe in real world studies. EVEREST II confirmed the validity. In recent years, plenty of other devices have developed rapidly, such as PASCAL and Valve Clamp, while the former of which has completed a few cases.

METHODS

Search strategy: ((((((TMVR) OR (PMVR)) OR (percutaneous mitral valve edge-to-edge repair)) OR (Transcatheter mitral valve repair)) OR (percutaneous mitral valve repair)) OR (transcatheter mitral valve edge-to-edge repair)) AND (((gender[Title]) OR (sexuality[Title])) OR (sex[Title])) OR (((Sexuality"[Mesh]) OR (Sex"[Mesh])) OR (Gender Identity"[Mesh]))).

Participant or population: Patients with transcatheter mitral valve repair (TMVR).

Intervention: Compare the effect of gender difference on the prognosis of transcatheter mitral valve repair.

Comparator: Compare the effect of gender difference on the prognosis of transcatheter mitral valve repair.

Study designs to be included: Cohort study.

Eligibility criteria: (1)reported patients with MR treated TMVR. (2)had available data and significant outcomes such as short or long term mortality and post TMVR complications; (3)aimed to compare the differences between men and women.

Information sources: Determine the search terms through the "PICO" principle, conducted systematic electronic searches on Pubmed, Embase, Web of Science, Cochrane Library, and manually searched the references of the included documents to identify other publications. The time was from the establishment of the database to February, 2021. The objective was to find all relevant documents regarding gender and the relationship between transcatheter mitral valve repair.

Main outcome(s): All-cause mortality(≤ 30 days), mitral regurgitation class(after 1 year), NYHA class, Stroke(≤ 30 days), Acute Kidney Injury (≤ 30 days), Myocardial Infarction(≤ 1 year), Long-term mortality(in 1 year).

Data management: The retrieved articles from the databases were exported to Endnote X9 for duplicate removal and further categorization. The full text of reviews will also be uploaded and attached to Endnote X9. We shall perform predevelopment Microsoft Excel 2019 spreadsheets to extract data and later export into tables and figures.

Quality assessment / Risk of bias analysis: The risk of bias in the included literature was referenced to the Newcastle-Ottawa

Scale (NOS). Evaluation items include: ① Representation of the exposed cohort; ② Selection of the non-exposed cohort; ③ Ascertainment of exposure; ④ Demonstration that outcome of interest was not present at start of study; ⑤ Comparability of cohorts on the basis of the design or analysis ; ⑥ Assessment of outcome; ⑦ Was follow-up long enough for outcomes to occur ; ⑧ Adequacy of follow up of cohorts. Only the fifth item was 2 points, other items were all 1 point. The score of the scale is 0-9, and when the score is ≥ 7 , it is considered to be a study with low risk.

Strategy of data synthesis: All data analysis was performed using RevMan5.3 software. We choose unadjusted raw data because various studies have not adjusted for the same set of confounding factors. Binary variables are represented by odds ratio (OR), continuous variables are represented by mean difference (MD) for consistent measurement units. All variables are calculated with 95% confidence intervals (95%CI). All reported P values are two-sided, and $P < 0.10$ and $I^2 \leq 50\%$. Otherwise, the heterogeneity of the study was considered significant and the random effects model was used for analysis.

Subgroup analysis: If there were identified single factors that influenced heterogeneity between included studies, we would perform a subgroup analysis.

Sensitivity analysis: For studies with significant heterogeneity or high risk of bias, sensitivity analysis will be used to verify the stability of the combined effect.

Language: Articles written in English.

Country(ies) involved: China.

Keywords: Mitral valve regurgitation, Transtheter mitral valve repair,gender,meta-analysis.

Dissemination plans: The full article will be published in the public journal as a paper.

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