

The Efficacy of Ivabradine of Beta Blockers in Comparison of Atenolol and Metoprolol in Patients with Mitral Stenosis in Sinus Rhythm: A Systematic Review and Meta-Analysis

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Abstract

Introduction

The Mitral Stenosis is a common disease, which increased heart rate can be a sign of deterioration. Patient heart rate regulation, especially during exercise, is very important. The aim of this study was to evaluate the efficacy of Ivabradine in comparison with Atenolol and Metoprolol beta-blockers by examining Maximum exercise heart rate in patients with Mitral Valve Stenosis.

Methods and Results

In order to evaluate the efficacy of Ivabradine in comparison with beta-blockers, the systematic search was conducted using PICO keywords in the most important electronic databases, Cochrane Library, PubMed, Web of Science, CRD, Scopus, and Google Scholar. The articles were selected separately by reviewing the titles, abstract and full text of the articles, and extracting unrelated and repetitive articles by two individuals. Extracting the article information based on the measured outcome of Maximum exercise heart rate was done by two individuals independently. In cases where there was disagreement, the decision was made by a third person. To evaluate the quality of the articles, the Cochrane tool and the Revman software version 5.3 were used. The I^2 index was used to investigate the heterogeneity of the products. The publication bias between studies was evaluated using a Funnel Plot and Egger's Regression Test. The results of the fixed effects model were used to combine the results and the mean difference with 95% confidence interval for the consequences was calculated. This meta-analysis was performed using the Meta Package R software. Finally, four studies entered meta-analysis. The total number of patients treated with Ivabradine and beta-blockers was 128 and 132, respectively. Homogeneity between studies was not significant ($I^2 = 36\%$; P -value = 0.20). The results of meta-analysis showed that the difference in mean Max Exercise HR of patients was 3.73, which was statistically significant (Mean Difference = 3.73; 95% CI: 1.52; 5.94; P -value = 0.001).

Conclusions

The administration of Ivabradine, in contrast to Atenolol and Metoprolol, greatly increases the ability of a person to test exercise, administration of this drug in patients with mitral valve stenosis can lead to a decrease in heart rate, which in turn causes reducing the risk of heart attacks in these patients.

Key words

Rate control; Heart rate; mild to moderate mitral Stenosis; Exercise.