

Effect of Early Metoprolol before PCI in ST-Segment Elevation Myocardial Infarction on Infarct size and left ventricular ejection fraction. A systematic review and Meta-analysis

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Background and Aim

ST-segment elevation myocardial infarction (STEMI) is the most life threatening condition for people with coronary artery disease. Metoprolol has been reported to reduce the size of myocardial infarctions (MIS) while maintaining LV function. The goal of this meta-analysis is to evaluate the impact of early intravenous metoprolol in STEMI before PCI on infarct size, as measured by CMR, and left ventricular ejection fraction.

Methods

From inception to 18 January 2022, we searched the following databases: PubMed, Scopus, Cochrane library, and Web of Science. We included only randomized control trials that reported the use of early intravenous metoprolol in STEMI before PCI on infarct size, as measured by CMR, and left ventricular ejection fraction. RevMan software 5.4 was used for performing the analysis.

Results

Following a literature search, 340 publications were found. Finally, 18 studies were included for the systematic review and 8 clinical trials were included in the meta-analysis after full text screening. At one week, the pooled effect revealed a statistically significant association between Metoprolol and increased LVEF (%) compared to controls (MD= 2.98, [95 % CI= 1.26 to 4.69], P = 0.0007), as well as decreased infarcted myocardium (%) compared to controls (MD= -3.21, [95 % CI= -5.24 to -1.18], P = 0.002).

At 6 months, the pooled effect revealed a statistically significant association between Metoprolol and increased LVEF (%) compared to controls (MD= 3.57, [95 % CI= 2.22 to 4.92], P < 0.00001), as well as decreased infarcted myocardium(g) compared to controls (MD= -3.84, [95 % CI= -5.75 to -1.93], P < 0.0001).

Conclusion: Early intravenous Metoprolol could reduce the infarct's size and improve the LVEF% in STEMI patients, before PCI, at one-week and 6-month. More multicenter randomized clinical trials are needed to back up our findings.