Randomized trial of adenosine-induced cardioplegic arrest in coronary artery bypass grafting patients

Abstract

Background & Aims

The role of adenosine in cardioprotection is controversial, and no consensus exists concerning its application. In this prospective randomized controlled trial, we evaluated the possible effects of adenosine-induced cardioplegic arrest on cardiac performance and cardiac biomarkers after coronary artery bypass grafting.

Materials and Methods

Forty-three patients scheduled for elective or urgent coronary artery bypass grafting were recruited. Patients were randomized to receive 20 mg of adenosine (in 21 patients) or saline (in 22 patients) into the aortic root during the first cardioplegia infusion. The time to asystole was compared between the groups. Cardiac index, right ventricular stroke work index, left ventricular stroke work index and cardiac biomarkers were compared between the groups at four predefined time points. Electrocardiographic data and clinical outcomes were compared between the groups.

Results

Right ventricular stroke work index recovered better in the adenosine group ($p = .008$). There were no significant overall differences in cardiac index and left ventricular stroke work index between the groups, although the post-cardiopulmonary bypass cardiac index was better in the adenosine group (2.3 vs 2.1 l/min/m^2, $p = .016$). Compared with saline, adenosine reduced the time to asystole (68 vs 150 seconds, $p = .005$). There were no significant differences between the groups in cardiac biomarker values.

Conclusion

An adenosine bolus at the beginning of the first cardioplegia infusion enhanced the right ventricular stroke work index as well as the immediate post-cardiopulmonary bypass cardiac index and resulted in significantly faster asystole in coronary artery bypass grafting patients.