HTK Versus Multidose Cardioplegias for Myocardial Protection in Adult Cardiac Surgery: A Meta-Analysis

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Background

Histidine–tryptophan–ketoglutarate (HTK) cardioplegia for myocardial protection obviates the need for maintenance cardioplegia doses, and thus allows for greater focus on procedure accuracy. The aim of this meta-analysis is to evaluate the safety and efficacy of HTK versus multidose cardioplegias during cardiac surgery in an adult population.

Methods

Electronic searches were performed using PubMed, Science Direct, and Google Scholar databases. The key search terms included HTK cardioplegia AND cardiac surgery AND adult. This was followed by a meta-analysis investigating cardiopulmonary bypass (CPB) duration, cross-clamp duration, spontaneous defibrillation, inotropic support, mortality, atrial fibrillation, creatine kinase muscle brain band (CK-MB) and troponin I (TnI).

Results

Seven randomized controlled trials (n = 804) were analyzed. Spontaneous defibrillation following aortic cross-clamp removal significantly favored HTK (odds ratio [OR], 2.809; 95% confidence interval [CI], 1.574 to 5.012; I2 = 0%; p < .01). There were no other notable significant differences between HTK and multidose cardioplegia in any of the parameters measured. In particular, the OR for mortality was 1.237 (95% CI, 0.385 to 3.978; I2 = 0%; p = .721) and the mean difference for CPB duration overall was 2.072 min (95% CI, −2.405 to 6.548; I2 = 74%; p = .364).

Conclusion

HTK is safe and effective during adult cardiac surgery when compared with multidose cardioplegias for myocardial protection during surgical correction of acquired pathology in the adult population. HTK may, therefore, be suitable for complex cases or those of extensive duration, without the prospect of increased postoperative morbidity or mortality.

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