


eComment: Long-term outcome after coronary artery bypass grafting in patients with left ventricular dysfunction: does the type of cardioplegia matter?

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I read with interest Mr. Jacob’s best evidence topic entitled ‘Is blood cardioplegia superior to crystalloid cardioplegia?’ [1]. I congratulate him and his colleagues for the efforts made to reach an answer on this issue. We all know that there still is controversy regarding which cardioplegic solution, temperature and route of administration is superior to others. There is also evidence as shown by Jacob et al. that there is enhanced postoperative myocardial protection with cold blood cardioplegia. We know also that high risk patients such as the ones with left ventricular dysfunction benefit most from optimal cardioplegia. Our study [2] is one of the papers mentioned in Jacob et al. paper. We attempted to answer the question of whether the cardioplegic type affect outcome and survival in patients in the study group. We had nine years follow-up of this group of patients by contacting their general practitioners, primary health authorities and telephone interviews with patients and their families. We found out that 1, 3, 5, 8-year survival was 96%, 92%, 88%, 76% in the blood group and 100%, 100%, 96%, 88% for the crystalloid group. There was no difference in the incidence of myocardial infarction between both groups. There was increased incidence of recurrence of angina and the rate of re-intervention in the crystalloid group but did not reach a statistical significance. We conclude that St Thomas’ No 1 cold blood cardioplegic solution enhanced immediate postoperative myocardial protection, but has no advantage on long-term mortality or morbidity.

References


eComment: Is blood cardioplegia superior to crystalloid cardioplegia in pediatric cardiac surgery?

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The relative advantage of blood cardioplegia in relation to crystalloid cardioplegia is still the subject of debate. In spite of theoretical advantages with blood cardioplegia, the research literature is equivocal and crystalloid cardioplegia remains in use at several centres as illustrated by the BET authored by Jacob et al. [1]. Interestingly, the authors ignored the pediatric cardiac surgical population in their BET.

Congenital heart surgeons like their adult cardiac surgery colleagues are also divided with respect to their use of blood and crystalloid cardioplegic solutions. In the opinion of this author it would perhaps be useful to look at the current best available evidence to see if a more convincing and meaningful conclusion can be drawn for the pediatric population than their adult counterparts as suggested by the BET by Jacob et al. [1].

To date four randomised controlled trials (RCTs), recruiting 311 pediatric patients, have been conducted to specifically address this issue [2–5]. Of these, the trials by Modi et al. [2] and Amark et al. [3] reported different outcomes in two different publications. Whereas all the recent trials [2–4] conclude that blood cardioplegia offers superior protection, as it preserves myocardial metabolism and function more effectively than crystalloid cardioplegia in infant cardiac surgery, the trial by Young et al. [5], recruiting 138 patients, failed to demonstrate clear clinical advantage of antegrade cold blood cardioplegia over crystalloid cardioplegia during hypothermic cardioplegic arrest in pediatric cardiac surgery. However, arbitrary decision-making for inotropic support, subjective echocardiographic assessment of ventricular function along with the fact that the study by Young et al. [5] was performed in 1994, at a time when cardioplegic techniques were still being refined, are all important limitations which must be taken into account before accepting their conclusion.

It is extremely important to realize that although the differences in myocardial cellular and subcellular functions in neonates, the effects of cyanosis, cardiopulmonary bypass, systemic perfusion temperatures, and of reperfusion, and the varied pathologic entities involved obfuscate cardioplegic effects, evidence from RCTs is convincing enough to suggest that the benefits of blood cardioplegia are more pronounced in younger, cyanotic patients requiring longer aortic cross-clamping. On the other hand, for acyanotic patients the cardioplegic technique is not critical.
References


