Characterization of aortic root pressure during administration of blood- and crystalloid cardioplegia

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Background: Cardioplegic solutions (blood and crystalloid) compositions are introduced into the coronary arteries to arrest the heart and protect the myocardium during cardiac surgery. The optimal infusion pressure for cardioplegic delivery is unknown and may vary for crystalloid and blood based solution. Some studies suggest that the aortic root pressure (ARP) should be between 80-100 mmHg to achieve a good myocardial protection. The aim of the current study was to investigate and characterize the aortic root pressure during administration of blood and crystalloid cardioplegia in patients undergoing open heart surgery.

Methods: 14 adult patients with 3 vessel disease, undergoing elective coronary artery bypass grafting. All patients alternately received cold antegrade blood and crystalloid cardioplegia, in random order. The blood cardioplegia was given by a roller pump, and crystalloid by pressure bag. In the lines of both systems, we measured the proximal pressure, the distal pressure and the aortic root pressure during delivery of supplementary doses. All 3 pressures were measured after 20, 35 and 50 seconds. Also Hct, MAP, CVP, Tp and flow were recorded. Mean pressures were calculated, and compared.

Results: ARP was significantly higher during administration of blood cardioplegia. The mean ARP for blood cardioplegia was 53.3 mmHg while it was 35.8 mmHg during administration of crystalloid cardioplegia. p-value of (0.005). Pressure loss were higher in crystalloid than in blood delivery line.

Conclusion: Administration of cold blood cardioplegia is associated with higher, and maybe more appropriate aortic root pressure than crystalloid, in our hospital setup.