Rewarming Rate and Aortic Cannula Length During Mild Hypothermic Cardiopulmonary Bypass

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Objective: Brain hyperthermia during the rewarming phase of cardiopulmonary bypass may lead to neurological injury. Rewarming rate has been directly related to jugular bulb (SjvO2) desaturation which in turn has been associated with poorer neurological outcomes. Nasopharyngeal (NP) temperature monitoring reflects accurately deep brain temperature. Our prospective study tested the hypothesis that use of long aortic cannula which extended beyond the left common carotid artery, can decelerate the rewarming rate and hence avoid brain hyperthermia.

Methods: 108 patients underwent elective ON pump cardiac surgery were studied. Group1 (N=54) using long aortic cannula, Group2 (N=54) using short aortic cannula. During rewarming 4^0-6^0C difference between nasopharyngeal – CBP perfusate were maintained in both groups until maximal rewarm temperature (37^0C). Groups were compared for Rewarming rate – Δ Temperature / Time from start rewarming to maximal rewarm temperature. Other factor that could influence the rewarming rate were also compared – BMI (Body Mass Index), Diabetes mellitus, Oxigenator type.

Results: Mean rewarming rate was 0.296±0.121 in group 1 and 0.307±0.147 in group 2 (p=0.31). There was no different in rewarming rate between Diabetes and non diabetes (0.297±0.114; 0.303± 0.147; P=0.194); BMI ≥ 30 and BMI<30 (P=0.261) and Oxygenator type (P=0.449).

Conclusions: Use of long aortic cannula which extended beyond the left common carotid artery during on pump cardiac surgery do not influence the rewarming rate and hence do not reduce brain hyperthermia.