

SCA 75

THE DEGREE OF HEMODILUTION DURING CARDIOPULMONARY BYPASS IS RELATED TO RENAL FAILURE IN ADULT CARDIAC SURGERY

Karkouti K, Beattie S, Wijesundera D, Chan C, Rao V, Datillo K, Djaiani G, Ivanov J, Karski J

Toronto General Hospital, Toronto, Ontario, Canada

Background: This observational study sought to determine if the degree of hemodilution during cardiopulmonary bypass (CPB) is independently related to perioperative acute renal failure (ARF) by controlling for variables known to be associated with perioperative renal failure and anemia.

Methods: Following REB approval data were prospectively collected on consecutive patients undergoing cardiac surgery with CPB from 1999 to 2003 at a tertiary care hospital. The independent relationship between degree of hemodilution during CPB, as measured by nadir hematocrit concentration (nHct), and ARF was assessed using multivariable logistic regression.

Results: Of the 9084 patients included in the analysis, 1.5% (N=134) developed ARF. There was an independent, U-shaped relationship between nHct during CPB and ARF. Moderate hemodilution (nHct 22-26%) was associated with the lowest risk of ARF, with the risk increasing as nHct deviated from this range in either direction. Compared to moderate hemodilution, the adjusted odds ratio for ARF with severe hemodilution (nHct <22%) was 2.03 (95% C.I. = 1.28-3.21), and for mild hemodilution (nHct >26%) was 2.51 (95% C.I. = 1.31-4.82); P = 0.01.

Conclusions: Since there is an independent relationship between degree of hemodilution during CPB and perioperative ARF, patient outcomes may be improved if the nHct during CPB is kept within the identified 'optimal' range. Randomized clinical trials, however, are needed to determine if this is a cause-effect relationship or simply an association.

Figure 1. Estimated spline transformation and 95% confidence interval for nadir hematocrit and ARF

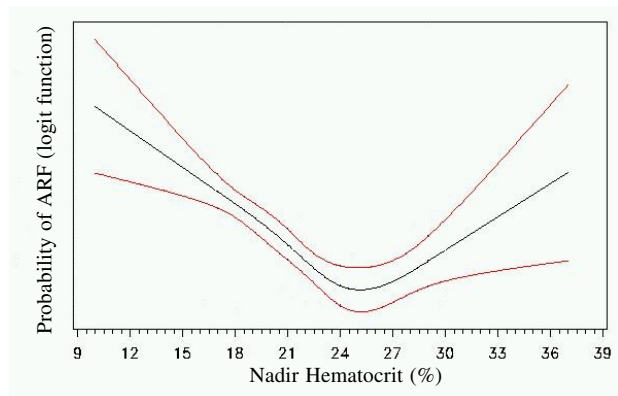
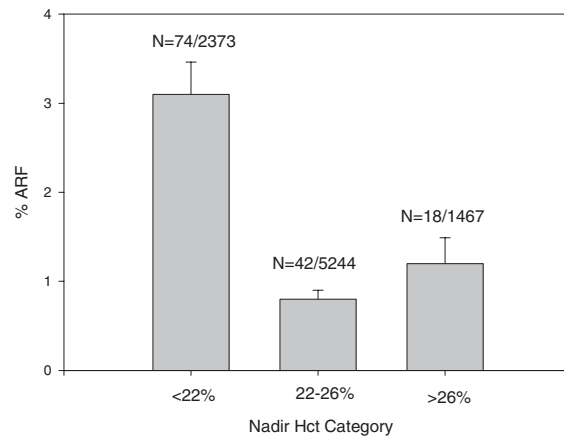


Figure 2. Bivariate relationship between nadir hematocrit during cardiopulmonary bypass and ARF



Bars are standard error