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Format: Abstract

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Ideal Hematocrit to Minimize Renal Injury on Cardiopulmonary Bypass.

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Abstract

OBJECTIVE: Renal dysfunction after cardiopulmonary bypass (CBP) ranges from subclinical injury to established renal failure requiring dialysis. The pathophysiology is multifactorial, and recently, hemodilution during CBP has been thought to be an important determinant of postoperative renal injury. In this study, we attempted to assess the independent effect of hemodilution on renal function. We also aimed to identify the optimal hematocrit where hemodilution-induced renal injury is minimal.

METHODS: A prospective observational study was conducted on 200 patients between February 2012 and July 2013. One hundred fifty patients were included in the study group, who were further subdivided on the basis of lowest hemodilution as mild hemodilution (>25%), moderate hemodilution (21%-25%), and severe hemodilution (<21%) categories. The primary outcome of the study was renal outcome measure, which was assessed by comparing the creatinine clearance across the groups.

RESULTS: The creatinine clearance decreased over a period in all three groups. When compared with mild or moderate hemodilution, the reduction in creatinine clearance was significantly higher in the group with severe hemodilution ($P \leq 0.0001$). However, there was no significant difference in creatinine clearance reduction between the mild and moderate hemodilution groups ($P = 0.813$; 95% confidence interval, -8.41 to 10.68).

CONCLUSIONS: Based on our observations, we would like to propose that a hematocrit of 21% should be considered the critical threshold. Hematocrit below this value of 21% during CBP is associated with the most significant deterioration in renal function.

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