

SCA 63

COMPARISON OF NOVEL HYDROXYETHYL STARCH (150/0.4) AND STANDARD HYDROXYETHYL STARCH (200/0.5) IN OFF PUMP CORONARY ARTERY BYPASS SURGERY

Mehta Y, P S, Dhar A, Trehan N

Escorts Heart Institute and Research Centre, New Delhi, Delhi, India

Objective: To compare the new hydroxyethyl starch (voluven) with the standard HES (200/0.5) in Off pump coronary artery surgery

Design: Prospective randomised clinical study

Participants: Forty adult patients undergoing Elective OPCAB with no significant risk factors.

Interventions: Forty patients with normal pulmonary and left ventricular function scheduled for elective OPCAB were randomly allocated into two groups. Group 1 received voluven and group 2 HES 200/0.5 upto a maximum of 20 ml/kg throughout surgery. Parameters evaluated included cardiac index, systemic vascular resistance, urine output, blood gas parameters, pulmonary mechanics, (compliance, shunt fraction, PaO₂/Fio₂, extravascular lung water) and coagulation parameters like platelet count, prothrombin time, partial thromboplastin time. Hemodynamic comparisons were done at preinduction, post induction, poststernotomy, during left anterior descending, lateral and right anastomosis, post protamine and poststernal closure. Samples for hematological evaluation were drawn before induction, as soon as they were admitted into ICU and the next day. Pulmonary mechanics comparisons were done 6 hrs into ICU and post extubation, in addition to the above mentioned points of time. Cardiac output was analysed by pulse contour method.

Results: Hemodynamics were similar in both the groups. Both groups showed an increase in shunt fraction and reduction of paO₂/Fio₂ during the post sternal closure period. Voluven group showed an increase in shunt fraction from 11.4 to 14.5 whereas HES 200/0.5 group showed an increase from 11.2 to 15.4, though the difference was not statistically significant. Pao₂/Fio₂ values varied from 368.81 to 330.91 in voluven group and from 359.63 to 310.96 in HES 200/0.5 group. Voluven group had less increase in shunt fraction and decrease in PaO₂/Fio₂ when compared to HES 200/0.5 group though not statistically significant. Extravascular lung water ranged from 40.766 to 35.739 in voluven group and from 40.6147 to 39.9155 in HES 200/0.5 group. Prothrombin time was more in the HES 200/0.5 group when compared to voluven on the first post-operative day (p<.05). Blood loss in the ICU was also less in voluven group as compared to HES 200/0.5 (295.122 in voluven group and 334.150 in HES 200/0.5 group). Extubation time was similar in both the groups. Perioperative mortality was nil in both the groups.

Conclusion: Voluven group was found to be superior to HES 200/0.5 with regards to oxygenation parameters. (Pao₂/Fio₂ and shunt fraction). Voluven showed less derangement in prothrombin time when compared to HES 200/0.5. Blood loss was also less in voluven group.

References:

1. Boldt J, Lehmann A, Rompert R, et al. Volume therapy with a new HES solution in cardiac surgical patients before cardiopulmonary bypass. *J Cardiothorac Vasc Anesth* 200; 14:264-8
2. Gallandat Huet RC, Siemons HW, Baus D, et al. A novel HES for effective perioperative plasma volume substitution in cardiac surgery. *Can J Anesth* 200; 47: 1207-15