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We investigated the effects of coating a cardiopulmonary bypass (CPB) circuit and oxygenator with poly-2-methoxy-ethyl acrylate (PMEA) on the systemic inflammatory response during and after CPB. Thirty patients undergoing elective cardiac surgery were randomized into three groups (each group n = 10): noncoated (group N), heparin coated (group H), and PMEA coated circuit and oxygenator (group X). Bradykinin (BK), complement 3 activation (C3a) and interleukin-6 (IL-6) levels were measured as early phase indicators of inflammatory response, as were maximum C reactive proteins (CRP) and white blood cell (WBC) levels. The alveolar-arterial oxygen gradient (A-a DO2) was measured as a parameter of respiratory function. IL-6 levels after CPB were significantly higher in group N than in groups H and X (p < 0.05). Serum BK and C3a levels showed similar patterns in all groups. A-a DO2 was lower at the end of and 3 hours after CPB in groups H and X than in group N (p < 0.05). Maximum CRP levels were lower in group X than in groups N (p < 0.05). This prospective study suggests that PMEA coated CPB may improve respiratory function and decrease systemic inflammatory response after cardiac surgery, possibly because this circuit is as biocompatible as heparin coated CPB circuit.

PME coating of pump circuit and oxygenator may attenuate the early systemic inflammatory response in cardiopulmonary bypass surgery.

Ueyama K, Nishimura K, Nishina T, Nakamura T, Ikeda T, Komeda M.

Biocompatibility of heparin-coated cardiopulmonary bypass circuits in coronary patients with left ventricular dysfunction is superior to PMEA-coated circuits.

Hemocompatibility of PMEA coated oxygenators used for extracorporeal circulation procedures.

Biocompatibility of poly2methoxyethylacrylate coating for cardiopulmonary bypass circuit.

A new poly-2-methoxyethylacrylate-coated cardiopulmonary bypass circuit possesses superior platelet preservation and inflammatory suppression efficacy.

In vivo comparison study of FDA-approved surface-modifying additives and poly-2-methoxyethylacrylate circuit surfaces coatings during cardiopulmonary bypass.

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