TITLE: PLASMA RANTES CONCENTRATIONS DURING ON-PUMP OR OFF-PUMP CORONARY ARTERY BYPASS GRAFTING SURGERY

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INTRODUCTION: Cardiopulmonary bypass (CPB) is known to induce platelet activation and a systemic inflammatory response. RANTES (regulated on activation, normal T cells expressed and secreted), a CC-chemokine with a potent chemoattractant activity, is secreted by lymphocytes and constitutively present in platelet α -granules and released upon platelet activation. Decreased levels of RANTES (1) and lymphocyte depletion (2) have been observed in patients following CPB. The data on RANTES after off-pump cardiac surgery are scarce. The present study was designed to determine the RANTES levels and platelet depletion in patients undergoing on-pump or off-pump cardiac surgery.

METHODS: After obtaining the approval of the ethics committee and written informed consents, fourteen patients undergoing elective coronary artery bypass grafting (CABG) surgery with or without CPB were included in this study. Blood was collected at seven sequential time points and analyzed for RANTES concentrations. The postoperative platelet and lymphocyte counts were examined.

RESULTS: The plasma levels of RANTES in patients with CPB decreased significantly 2 to 6 hours after the start of CPB ($3,200 \pm 700$ pg/mL and $2,900 \pm 800$ pg/mL, both $P < 0.05$, compared with $7,200 \pm 1,500$ pg/mL before induction), while the RANTES levels in patients with off-pump CABG did not ($2,500 \pm 900$ pg/mL, $P = 0.165$ at 4 hours after application of a stabilization device, compared with $6,100 \pm 2,700$ pg/mL before induction). In addition, both of the postoperative platelet counts ($148,000 \pm 11,000$ / μ L, $P < 0.05$, compared with $213,000 \pm 26,000$ / μ L before operation) and total lymphocytes (862 ± 159 / μ L, $P < 0.01$, compared with $1,711 \pm 196$ / μ L before operation) decreased significantly at 4-6 hours after beginning CPB.

DISCUSSION: The present study demonstrated that CPB causes a decrease in the concentration of plasma RANTES. The corresponding platelet and lymphocyte depletion suggests that RANTES is derived primarily from platelets and lymphocytes following CPB-induced inflammatory and immune response.

REFERENCES:

1. Ann Thorac Surg 2001; 71:233–237.
2. Ann Thorac Surg 1987; 44: 277–282.