Introduction: Coronary artery bypass grafting (CABG) surgery with cardiopulmonary bypass (CPB) is associated with activation of inflammatory mediators that may cause multi organ dysfunction. The aim of this study was to examine whether administration of five doses of oral pentoxifylline (PTX) before initiation of CPB has beneficial clinical effects on this inflammatory response in different organs.

Methods: After approval of Research Committee of Anesthesiology Department and obtaining informed consent, 64 patients undergoing elective CABG with CPB were enrolled in this randomized double-blind clinical trial study. Participants were allocated into two groups on the preoperative day: Patients in the PTX group (n=32) received 400 mg of pentoxifylline at 5 different time points. Considering the half-life and the peak concentration of PTX, three doses were prescribed by oral route every eight hours before surgery. The fourth and fifth doses were solved in 30 mL of normal saline and administered after induction of general anesthesia and before initiation of CPB through a nasogastric tube, respectively. Patients in the control group received placebo pills at the same time points as PTX group. Blood samples for measurements of creatinine, erythrocyte sedimentation rate (ESR), AST/ALT, troponin and white blood cell (WBC) count as evidence of inflammatory response were taken in both groups before initiating PTX or placebo and at the morning of the first postoperative day. PaO2/FiO2 and dynamic pulmonary compliance were measured postoperatively at first hour (t1), 2 hours (t2), 6 hours (t3) after the admission to intensive care unit (ICU). Data were analyzed by SPSS.16 software using Student's t-test, Mann-Whitney U-test, chi-square test and repeated measures ANOVA. P<0.05 was considered as significant.

Results: ESR, WBC, ALT and creatinine plasma levels increased in both groups after surgery, with a higher increase in the control group (P < .05). Dynamic lung compliance was 53.4 ml/cm H2O in the PTX group and 34.1 ml/cm H2O in the control group at t3 (P < 0.05). PaO2/FiO2 was 169 mm Hg in the PTX group and 115 mm Hg in the control group at t3 (P < 0.05). Duration of mechanical ventilation was significantly longer in control group (7.5 vs. 9.1 hours; p < 0.05). There was no significant difference in the duration of postoperative ICU stay.

Discussion: Prophylactic use of oral pentoxifylline as a regimen described in this study appears to improve postoperative organ function in patients undergoing CABG with CPB.