TITLE: MASS SPECTROMETRIC MEASUREMENT OF OXYGEN UPTAKE IN THE POSTOPERATIVE PERIOD OF MAJOR ABDOMINAL SURGERY : EFFECT OF CLONIDINE

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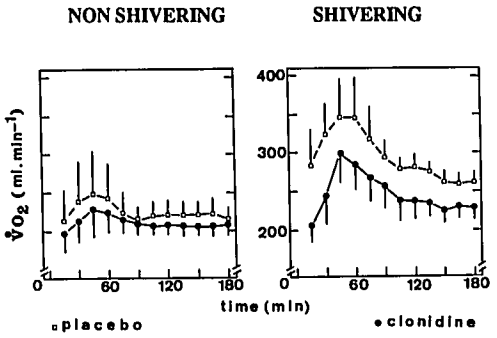
Postanesthetic shivering is associated with a dramatic increase in oxygen demand, and thus in cardiac output, which might be poorly tolerated in patients with limited cardiac reserve. An alpha 2 adrenergic agonist, clonidine, was reported to reduce the incidence of shivering following coronary[1] or aortic[2] surgery. The present study examined if clonidine 1) exerts the same beneficial effect following major abdominal surgery, and 2) reduces the metabolic consequences of postanesthetic shivering.

After institutional approval and informed consent, 28 patients were enrolled in the study. They underwent colonic or colo-rectal surgery and received during anesthesia either clonidine (5 µg/kg IV over 3h, n=14) or placebo (n=14). In the postoperative period, heart rate (HR), mean arterial pressure (MAP) and oesophageal temperature were measured for 6h. VO_2 was measured for 3h using a mass spectrometer system[3]. In the same period clinical occurence of shivering was noted. Results were expressed as mean±SE and evaluated by analysis of variance.

RESULTS: Six patients in each group presented clinical evidence of shivering. In the non-shivering patients, HR and MAP were significantly reduced in the clonidine group whereas VO_2 and oesophageal temperature changes were unaffected. Conversely, when shivering patients were considered, MAP and VO_2 were significantly reduced in the clonidine group whereas HR and oesophageal temperature were not.



CONCLUSION: 1) Clonidine administered at 5µg/kg over 3h intraoperatively does not modify the incidence of shivering after major abdominal surgery. 2) However, it reduces the VO_2 associated with shivering, which may be of value when cardiopulmonary reserve is limited.

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2-Anesthesiology 71 : A155,1989
3-Acta Anesthesiol Scand 32 : 691-697, 1988

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TITLE: HEPARIN AND PROSTACYCLIN IN PREDILUTIONAL HEMOFILTRATION

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Continuous veno-venous hemofiltration has been proven to be a safe and effective technique in acute renal failure. However, in the immediate postoperative period the necessary anticoagulation with heparin may be harmful as systemic effects of the anticoagulant induce the danger of hemorrhage. Therefore, we employed the potent, short acting inhibitor of platelet aggregation, prostacyclin, as a substitute for heparin in critically ill patients.

14 Patients with acute renal failure were studied during 18 periods of hemofiltration with a fluid exchange rate of 40-60 l/24h. Four patients were treated with prostacyclin as the single antithrombotic agent (group1) because of severe bleeding or danger of hemorrhage. 4 patients received low dose heparin (555±94 units/h) as the usual anticoagulant (group 2), and finally in 10 patients both heparin and prostacylin was given (group 3).

Prostacyclin was infused into the arterial line of the extracorporal circuit using an infusion rate of 5.1±0.7ng/kg body weight. Heparin dosage in group 2 was 555±94 units per hour and the infusion rate in group 3 for heparin was 430±66 IU/h and for prostacyclin 6.4±0.7 ng/kg/min.

There were no distinct differences in heart rate, mean arterial pressure and total peripheral vascular resistance in between the 3 groups of medication. By focusing on pulmonary hemodynamics there was a distinct lower mean pulmonary artery pressure (14.0±2.0 mm Hg) in patients receiving only prostacyclin compared to others (19.7±3.4, group 2, and 24.7±2.6 ,group3). The values for pulmonary vascular resistance (dyne sec cm^{-5}) were 84±13 in group 1, 131±21 in group 2 and 185±30 in group 3. Additionally, no significant difference in the $AaDO_2$ was observed between the three groups. By focusing on platelet function, i.e., the in vitro bleeding time, group3 showed lower values (54±9 sec) compared to group 1 (71±14 sec) and 2 (82±12 sec). The in vitro bleeding volume (microliters) was also lower in group 3 (125±22) compared to 1 (180±37) and 2 (186±26). Finally, the initial flow of the in vitro measurement of platelet function (microliters/min) was statistically less in group 3 compared to 2 (96±14 versus 166±22, $p<0.05$) and group 1 (119±22).

In conclusion, neither heparin nor prostacyclin caused clinically important changes within the intrinsic clotting system. Hemofiltration with either prostacyclin alone or prostacyclin with heparin as an adjuvant, guided by an new "in vitro test" of primary hemostasis, has been proven to be a safe technique for the treatment of renal failure in the immediate postoperative period.