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COMPARATIVE EFFECTS OF CLONIDINE AND
KETANSERINE ON POSTOPERATIVE SHIVERING.

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Beside its unpleasantness, postoperative shivering increases O_2 uptake and cardiac output. These effects can be undesirable particularly in patients with compromised cardiac function. Clonidine (1), a α_2 agonist, and ketanserine (2), a 5HT antagonist, have been proposed to treat postop shivering. We carried out 2 double blind randomized placebo controlled studies to compare the efficacy of these 2 drugs and explore the dose - response relationship of clonidine on postop shivering.

Both studies were approved by our institution ethical committee. In the first study, 54 patients without cardiac disease, shivering when admitted in the recovery room were included and randomly allocated to one of 3 treatments: P=saline placebo (n=19), C=150 μ g clonidine (n=15), K=10mg ketanserine (n=20). These treatments were administered as an IV bolus. The survival time of the shivering was recorded. The following parameters were also measured before treatment (BL), 1, 5, 10, 15, 30, 60, 120 min after treatment: systolic arterial P (SAP), diastolic arterial P (DAP), heart rate (HR), rectal temperature (T°) and SO_2 . Log-rank test was used to compare the shivering survival times; other data expressed as mean \pm SEM were analyzed by Zerbe's test. In the 2d study 40 shivering patients received IV saline or one of 3 doses clonidine (n=10): 150 μ g, 75 μ g, 37.5 μ g. The effect on shivering was evaluated 2 and 5 min after treatment: 0 = no effect, 1 = partial inhibition, 2 = total inhibition. SAP, DAP, HR, T° and SO_2 were measured at BL, 5 and 60 min after treatment. Dose-response curves were analyzed by Zerbe's method.

In the first study, the 3 groups were similar with regard to age, sex, BL SAP, DAP, HR, and T° . Mean survival times of shivering were significantly different in the 3 groups: C (127 sec \pm 55) and K (260 sec \pm 57) were significantly ($p<0.01$) shorter than P (720 sec \pm 95) and C effect was significantly ($p<0.05$) quicker than K. Median values were: P=720, C=60 and K=120 sec. C and K decreased SAP (at 30 min: P=133 \pm 4, C=119 \pm 5, K=124 \pm 4 mmHg), HR (at 30 min: P=74 \pm 4, C=64 \pm 3, K=68 \pm 3) and in a lesser extent DAP (at 30 min: P=72 \pm 2, C=70 \pm 5, K=71 \pm 3 mmHg) as compared to P. No significant differences were observed between C and K. SO_2 were similar in the 3 groups. C tended to slow patient rewarming particularly during the 30-120 min period of time ($p=0.06$). Patients from the 4 groups of the 2nd study were similar. The dose-response relationship of C was statistically significant ($p<0.01$) for the effect on shivering. After 2 min 75 μ g C reduced or abolished shivering in all patients whereas 150 μ g C inhibited all shiverings. After 5 min all patients stopped shivering in the 75 μ g C group. 75 μ g tended to produce less hemodynamic effects than 150 μ g, but the differences were not statistically significant (SAP: 75 μ g=19% drop vs 24% for 150 μ g). The effect on shivering (0,1,2) is shown hereby:

| Eff. on shiver. | 0 | 37.5 μ g | 75 μ g | 150 μ g |
|-----------------|---------------|---------------|---------------|-------------|
| 2 min | 0.5 \pm 0.2 | 0.8 \pm 0.3 | 1.7 \pm 0.2 | 2.0 |
| 5 min | 0.6 \pm 0.3 | 1 \pm 0.3 | 2.0 | 2.0 |

To conclude, both clonidine and ketanserine can be proposed as treatment of postop shivering. C (150 μ g) appeared to be more efficient than K (10 mg). C and K reduced SAP, HR more than P. C tended to slow patient rewarming. 75 μ g C appeared to be almost as effective as 150 μ g C and tended to induce less hemodynamic repercussions.

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Supported by BOEHRINGER INGELHEIM, Belgium.

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TITLE: The Incidence of Perioperative Myocardial
Infarction (PMI) in Patients with Prior
Percutaneous Transluminal Coronary
Angioplasty (PTCA)

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INTRODUCTION More than 30% of perioperative morbidity is related to the cardiovascular system. In patients with vascular disease, cardiac morbidity can reach 50% of all complications, with a high incidence of cardiac mortality. PMI is a leading contributor to cardiac morbidity. The risk of MI in patients with known coronary artery disease (CAD) is 2%; in patients with prior infarction, the rate is 6%. This incidence is reported to reach 10% in patients with vascular disease and 37% in patients with recent MI⁽¹⁾. Previous coronary artery bypass graft in vascular patients was found to decrease the risk of PMI to 1% and improve the mortality from cardiac complications from 2.4% to 0.9%.⁽²⁾ To date, there are no data available regarding the effect of previous PTCA on the incidence of PMI.

OBJECTIVES The aim of the study was to determine the incidence of perioperative MI in patients scheduled for vascular surgery who had a previous PTCA.

METHODS Sixty-one patients with CAD who underwent PTCA prior to an elective vascular operation were studied for evaluation of PMI. There were 35 males and 26 females. Nine patients were scheduled for abdominal aortic aneurysmectomy, 12 had carotid endarterectomy and 40 patients underwent lower extremity revascularization. A history of preoperative MI was described in 36 patients (59%), 13 had an old MI (> 12 months) (21.3%), 7 patients had an MI within 6 to 12 months, (11.5%) and 16 (26%) had a "recent" MI. (3 to 6 months) prior to surgery. Cardiac catheterization revealed: 11 patients with normal left ventricular function (LVF), mild impairment in 25 patients, 7 showed moderate dysfunction and 1 patient had severe LVF impairment. One and two vessel disease were seen in 9 and 28 patients respectively, 21 patients suffered from stenosis in 3 coronary arteries. The lapsed time between the PTCA to the vascular surgery was less than 3 months in 53 patients, 5 patients were operated within a year of their PTCA and 3 patients had the PTCA more than one year prior to surgery. General anesthesia was provided to 31 patients, regional anesthesia to 20, and 10 patients received monitored anesthesia care. Intraoperative events such as bradycardia, dysrhythmias, hypotension, hypertension and/or EKG ST-T changes were monitored. Routine EKG and daily enzymes were obtained post operatively, in all patients.

RESULTS Perioperative MI occurred only in one patient (1.6%) who had a preoperative MI more than 6 months before her carotid endarterectomy. Her cardiac catheterization demonstrated mild impairment of LVF and CAD in 3 vessels. Two months prior to her surgery she underwent PTCA of two vessels.

DISCUSSION All patients had vascular surgeries, 36 were known to have a prior MI and 44% of the MIs were only 3 to 6 months old. For this patient population, we would have expected a higher incidence of PMI (10- 37%). In contrast, our study demonstrated an exceptionally low incidence of PMI (1.6%). This significant difference can not be explained by perioperative monitoring or anesthesia technique. It is more likely that the O_2 supply/demand ratio was improved by the PTCA. Most PTCA were performed approximately 3 months prior to surgery.

In this study, patient with prior PTCA had a decreased risk for perioperative MI. In our opinion, patients with higher risk for PMI (i.e., vascular or recent MI patients) may benefit from coronary angiography and possible PTCA prior to elective surgery.

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I would like to thank Frances Rhoton, Ph.D., General Anesthesiology, and Norman Hertzler, M.D, Vascular Surgery for their help in collecting the data.