

Critical Care

Title : INCIDENCE OF CLONIDINE ORAL PREMEDICATION AND POSTOPERATIVE IV INFUSION ON HEMODYNAMIC AND ADRENERGIC RESPONSES DURING RECOVERY FROM ANESTHESIA

Authors : J.M. Bernard, M.D., B. Bourréli, M.D., M. Pinaud, M.D., C. Landault*, M.D., J.V. Bainvel **, M.D.

Affiliation : Département d'Anesthésie, ** Clinique Orthopédique, * Biochimie Médicale (Faculté de Médecine Pitié-Salpêtrière), Hôpital Saint-Jacques, Centre Hospitalier Universitaire 44035 Nantes cedex 01, France.

Introduction. Recovery from general anesthesia is associated with increased sympathetic nervous system discharge.¹ It has been suggested that oral clonidine (C) premedication can provide an amelioration of postoperative hypertension and/or tachycardia in surgical patients.^{2,3} Since there is a greater oxygen demand postoperatively, it is important that antihypertensive therapy not compromise cardiac function. This double-blind randomized study was designed to assess the effects of C, administered preoperatively by oral route and postoperatively by continuous iv infusion, on hemodynamic and adrenergic responses during the rewarming and the postoperative period.

Methods. The protocol was approved by our human investigation committee. Twenty-eight ASA I-II patients (mean age 56.7 years, range 36-79) undergoing total hip replacement gave their consent. They were randomly assigned preoperatively in 2 groups (n=14) to receive either C or a placebo (P) in the following sequence: a premedication (3.5 µg/kg) and then postoperative infusion (0.3 µg/kg/h). In all patients, anesthesia was maintained by isoflurane-N₂O with moderate deliberate hypotension and monitored by ECG, a 7.5 Fr Swan Ganz catheter and a radial artery cannula. The protocol study was started immediately after extubation and admission in the recovery room. Postanesthetic management was similar in both groups, including oxygen administration via a facial mask and systemic analgesia (10 µg/kg/h of morphine). Pulmonary artery blood temperature (θ°) was monitored. Hemodynamic data and samples for plasma epinephrine (E) and norepinephrine (NE) determinations using a radioenzymatic method were collected at three time intervals: before starting C or P infusion (T0); when θ° reached 37°C (T1); 6 hours after T1 (T2). Data were compared between groups by ANOVA followed by the Newman Keuls test; p<0.05 was considered as significant.

Results. Results are represented as mean±SD in the table. The two groups did not differ significantly in age, duration of surgery, hemodynamic data before premedication and θ° upon arrival in the recovery room. The time between T0 and T1 was 172±48 min in group C and 140±60 min in group P (NS). MAP was lower in group C than in group P (p<0.05). HR and SVRI were lower in group C than in group P (p<0.02 and p<0.05), whereas SI was higher (p<0.02). NE was lower in group C than in group P (p<0.02).

Discussion. Clonidine premedication was still efficient in terms of decreased HR, SVRI and NE upon arrival in the recovery room. These effects were easily maintained by a C continuous iv infusion, which added a lower blood pressure level. CI remained unchanged in all cases. The combination of premedication and postoperative infusion of C decreased the outflow of NE which might have had a favourable influence on the postoperative myocardial metabolic conditions.

Table. Pulmonary artery blood temperature (θ°), hemodynamic data and plasma catecholamines in the clonidine (C) and in the placebo (P) groups.

		T0	T1	T2
θ° (°C)	P	35.5±0.7	37	37.7±0.2
	C	35.5±0.5	37	37.8±0.4
MAP (mmHg)	P	100.1±17.4	83.4±2.4	86.5±11.9
	C	88.5±14.3	78.4±7.4	71.5±8.2*
HR (beats/min)	P	85±13	82±12	93±12
	C	67±8**	66±6**	72±6**
CI (l/min/m ²)	P	3.75±0.70	3.65±0.77	4.14±0.76
	C	3.64±0.69	3.70±0.39	4.18±0.69
SI (ml/beat/m ²)	P	43.5±9.3	44.7±9.0	44.4±9.1
	C	53.9±9.9**	56.5±6.5**	57.9±7.0**
SVRI (dyn.s/cm ⁵ /m ²)	P	1808±554	1416±498	1504±428
	C	1264±476*	1048±161*	936±259*
E (pg/ml)	(n=8) P	438±238	196±117	82±33
	(n=8) C	347±171	197±59	75±52
NE (pg/ml)	(n=8) P	770±344	423±205	411±62
	(n=8) C	399±190**	325±124	213±99**

*p<0.05, ** p<0.02 when compared between groups.

References.

1. Halter JB, Pflug AE, Porte D: Mechanism of plasma catecholamine increases during surgical stress in man. *J Clin Endocrinol Metab* 45: 936-944, 1977.
2. Flacke JW, Bloor BC, Flacke WE, Wong D, Dazza S, Stead SW, Laks H: reduced narcotic requirement by clonidine with improved hemodynamic and adrenergic stability in patients undergoing coronary bypass surgery. *Anesthesiology* 67: 909-917, 1987.
3. Ghignone M, Cavillo O, Quintin L: Anesthesia and hypertension: The effect of clonidine on perioperative hemodynamics and isoflurane requirements. *Anesthesiology* 67: 901-908, 1987.