Title: CLONIDINE DOES NOT RESULT IN ADVERSE EFFECTS ON ARTERIAL BLOOD GASES IN CONSCIOUS DOGS

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Introduction. Clonidine may become widely employed for pain management by epidural route in view of its potent analgesic effects.[1] Moreover, clonidine has been shown to reduce anesthetic requirements and improve hemodynamic stability during anesthesia when administered as oral premedication.[2] In view of its analgesic and sedative properties, clonidine may potentially produce respiratory depression. The present study was undertaken to assess the acute effect of high and low doses of intravenous clonidine on arterial blood gases in conscious chronically instrumented dogs.

Methods. Beagle dogs (9.8-14 kg) of either sex were instrumented with indwelling arterial and venous catheters at least two weeks before the experiments. After 60 min of stable hemodynamic conditions in a quiet and familiar environment, baseline respiratory rate (RR), blood pressure (BP) and ABG were measured. Clonidine 5 or 50 $ug.kg^{-1}$ dissolved in saline was injected over 5 min. RR, BP and ABG measurements were repeated every 10 min over a 40 min interval. Data were analyzed by ANOVA and p below 0.05 was considered to denote statistical significance.

Results. Results are reported in table. Clonidine either in low or high dosage did not induce hypercapnea nor hypoxia, nor change in pH in the experimental animals. Low dose clonidine produced an 18% reduction of mean BP; the highest dose decreased RR by 37% and reduced $PaCO_2$ approximately 17%.

Discussion. These results indicate that clonidine in clinically relevant doses does not have potential deleterious ventilatory effects, as the results of ABG and the RR indicate. These data obtained in conscious dogs are in keeping with data obtained in anesthetized rats given a similar dose of clonidine (5-10 $ug.kg^{-1}$ iv), where little variation of minute ventilation occurred; an increase in tidal volume was associated with a reduction in RR.[3] These results obtained with 5 $ug.kg^{-1}$ clonidine iv are relevant to clinical anesthesia, since doses in this range have been shown to be effective as the only premedication.[2] The lack of respiratory depressant effects observed with low dose clonidine support the clinical impression that it does not delay weaning from mechanical ventilation. Furthermore, since even high dose clonidine (50 $ug.kg^{-1}$) did not produce hypercapnea, it is unlikely that it will result in a potentiation of the respiratory depressant effects of narcotics and anesthetics. Although the effect of clonidine on CO_2 response curve should be evaluated in patients,[2] clonidine appears on both clinical and experimental ground, a valuable adjunct to anesthesia, since it improves hemodynamic stability, reduces anesthetic requirement and may provide analgesia when administered epidurally[1], without deleterious ventilatory effects.

References.

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*P<0.05
**P<0.01

		Interval (min) 0	20	40
Clonidine 5 $ug.kg^{-1}$ IV	$PaCO_2$ (mmHg)	29±1	29±3	31±2
	PaO_2 (mmHg)	91±2	95±4	96±3
	RR (min^{-1})	21±1	19±2	22±3
	Mean BP (mmHg)	116±5	95±10*	97±9*
Clonidine 50 $ug.kg^{-1}$ IV	$PaCO_2$ (mmHg)	32±1	26±2	29±2
	PaO_2 (mmHg)	94±3	95±4	92±1
	RR (min^{-1})	25±4	16±1*	16±3**
	Mean BP (mmHg)	94±3	111±2*	102±1*