Clonidine Reduces Halothane MAC in Rats

To the Editor:—We read with great interest the articles concerning the perioperative use of clonidine,1–3 and would like to comment on one possible mechanism for the anesthetic-sparing action4,6 of these α2-adrenergic agonists. Since the relationship between anesthetic requirements and neuronal activity in noradrenergic pathways has been demonstrated by us4 and others,7,8 we conducted pilot studies to determine whether noradrenergic neurotransmission was decreased by clonidine concomitant with a change in anesthetic requirements.

We measured MAC for halothane in groups of rats (n = 10) treated with clonidine 0.01, 0.1, and 1.0 mg/kg or saline vehicle i.p. as previously described.9 MAC for halothane decreased by 32%, 39%, and 42%, respectively, after these doses. Noradrenergic neurotransmission was measured in rats anesthetized with halothane 1.4% 60 min after i.p. administration of either vehicle or clonidine, 0.1 mg/kg in another group of 18 rats. The rats were decapitated and the monoamine neurotransmitters [norepinephrine (NE), dopamine (DA), and serotonin (5HT)] and their major metabolites [3,4-dihydroxyphenylethanol (DOPA), 3,4-dihydroxyphenylethanol glycol (DHPG); 3,4-dihydroxyphenylethanol acetic acid (DOPAC); and 5 hydroxyindoleacetic acid (5-HIAA)] were measured in discrete brain regions.6 The ratio of the concentration of the major metabolite to the parent amine concentration has been

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Referenced in text:

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**FIG. 1.** Effect of clonidine on noradrenergic neurotransmission in rats anesthetized with halothane. DHPG = the metabolite, 3,4-dihydroxyphenylethanol glycol; NE = norepinephrine; CE = cerebellum; ST = striatum; HY = hypothalamus; MI = midbrain; FC = frontal cortex; MP = medulla oblongata; HI = hippocampus; SC = spinal cord.
validated as being a measure of steady-state neurotransmitter turnover and, hence, neurotransmission in monoaminergic pathways. Using these ratios, we determined that noradrenergic neurotransmission was significantly (unpaired t test corrected for multiple comparisons) lower in animals treated with clonidine, 0.1 mg/kg, than in parallel control animals (fig. 1) Dopamine and serotonin turnover were unaffected.

While these studies do demonstrate concomitant reductions in noradrenergic neurotransmission and anesthetic requirements for halothane following clonidine administration, a causal relationship has not been established. Additionally, the postsynaptic alpha2 adrenoceptors may be an important mediating mechanism for the anesthetic-sparing action of the alpha2 agonists and require further investigation.

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REFERENCES


(Bronchial Intubation in Children: Does the Tube Bevel Determine the Side of Intubation?)

To the Editor:—In a recent report, Kubota et al. have shown that the angle of the tracheal bifurcation in children totalled approximately 80°; the right bronchial angle being 31 ± 5°, while the left bronchial angle was 49 ± 7°. This anatomic tracheobronchial relationship favors inadvertent or intentional intubation of the right mainstem bronchus. However, Block challenged this conclusion, suggesting that the tracheal tube invariably enters the right bronchus because the bevel of the tube faces to the left following insertion, and its tip, therefore, lies to the right of the midline of the trachea. In this report, we try to answer the question of whether the bevel of the tracheal tube determines the side of bronchial intubation in children.

Investigation was approved by the human studies committee. It was carried out on 10 children, aged 1-6 yr, undergoing inguinal herniorrhaphy during general anesthesia. For every child, two Portex® tracheal tubes of appropriate size were prepared; one of the tubes was the already available left-bevelled tracheal tube. The distal end of the second tube was modified to have about 45° right bevel; the edge was then polished and the tube resterilized. All children were premedicated with intramuscular pentobarbital 4 mg · kg⁻¹ and atropine 0.02 mg · kg⁻¹. Anesthesia was induced with iv thiopental 5 mg · kg⁻¹ and succinylcholine 1.5 mg · kg⁻¹, and the patient was ventilated by 100% oxygen. While the child was in the supine position with the head