Title: PHENYTOIN SUPPRESSION OF SUCCINYLCHOLINE-INDUCED FASCICULATIONS: A DOSE-RELATED RESPONSE

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INTRODUCTION: Phenytoin (Ph) suppresses repetitive activity arising from motor nerve terminals and diminishes acetylcholine output. Such Ph action would not only suppress prejunctional succinylcholine (SCh)-induced fasciculations but would also augment the effective SCh blocking potency.[1] For these reasons Ph may be a better choice for pretreatment than d-tubocurarine (dTC). The purpose of this study was to determine effective serum Ph levels that would suppress SCh-induced fasciculations in patients on chronic Ph therapy.

METHODS: After institutional approval, seventy patients on chronic Ph therapy scheduled for neurosurgical procedures were studied. Blood was drawn for serum Ph levels prior to induction. Anesthesia was induced with barbiturates and narcotics. SCh, 1 mg/Kg IV was administered without precurarization. Fasciculations were assessed visually. Patients were then assigned as follows: Group I = no fasciculations, Group II = fine tremors, Group III - minimal contractions, Group IV = vigorous contractions. Time from SCh injection to disappearance and reappearance of visible twitch (1Hz), adequacy of jaw relaxation, and incidence of coughing were noted and compared to a control group of fifteen patients, on no Ph, pretreated with dTC (3-5 mg IV). Data were analyzed using Bonferroni t-test.

RESULTS: Data are presented as the mean ± SD. Thirty-six patients with a mean serum Ph level of 66.2* ± 27.8 micromole/litre had no fasciculations. Eleven patients with a mean serum level of 28.0* ± 3.2 had fine tremors. Eleven patients with a mean serum level of 19.6* ± 1.6 had minimal contractions. Twelve patients with a mean serum level of 11.8* ± 4.9 had vigorous contractions (*$P<0.05$). Time-action relationship of the twitch response between Ph/SCh and dTC/SCh were not statistically different.

CONCLUSION: This study demonstrates that increasing serum Ph levels can suppress SCh-induced fasciculations. Patients with therapeutic levels of Ph (40-80 micromole/litre) should be effectively defasciculated.

REFERENCE: 1. Anesthesiology 65: 405-413, 1986

TITLE : CONTINUOUS MONITORING OF MIXED VENOUS OXYGENSATURATION DURING SITTING NEUROSURGICAL PROCEDURES.

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The use of improved fiberoptic systems in pulmonary artery catheters allows continuous assessment of mixed venous oxygen saturation ($S\bar{v}O_2$). The latter is an effective method of monitoring hemodynamically unstable patients and provides a sensitive way of detecting a change in a patient's clinical and hemodynamic condition [1]. Neurosurgical procedures performed in the sitting position are associated with important hemodynamic changes [2] and a risk of air embolism. We evaluated the usefulness of $S\bar{v}O_2$ monitoring in 9 seated patients, with a mean age of 48,2 ± 19,5 years. A Shaw Opticath pulmonary artery catheter was inserted through the right internal jugular vein in all patients. $S\bar{v}O_2$ values were closely related to those obtained from the laboratory (r = 0,94). After the patients were placed in the sitting position, we recorded a mean decrease of 8,25 ± 3,81 p.cent in $S\bar{v}O_2$ values in 8 patients. In 5 patients, the cardiac index (CI) was measured and found to decrease in 4 (mean = 12,5 ± 7,9 p.cent). This occurred despite a previous plasma volume expansion with 10-15 ml/kg of cristalloid and colloid solutions. Before surgical incision was performed, the surgeons infiltrated the operative site with 20 to 40 ml of lidocaine containing 1/100000 epinephrine. This was followed by a 13,9 ± 5,7 p.cent increase in $S\bar{v}O_2$ in 7 patients, and a 73,3 ± 29,9 p.cent increase in CI in 8 patients, without significant changes in either arterial pressure or heart rate. These effects are due to epinephrine and lasted approximately 30 mintes. They tend to offset changes induced by the sitting position. In 2 patients Peep was administred before lidocaine infiltration and resulted in a further decrease in both $S\bar{v}O_2$ and CI, probably due to a further reduction in venous return. In one of the patients, venous air embolism was detected by a drop in $S\bar{v}O_2$ from 73 to 55 p.cent while end-tidal CO_2 concentration fell from 2,1 to 0,5 p.cent . 60 ml of air were then evacuated and confirmed the diagnosis.

We can conclude that $S\bar{v}O_2$ monitoring in these procedures seems interesting in detecting acute hemodynamic alterations and serves as a guide for their treatment (plasma volume expansion or vasoactive drugs). However further work is needed to assess the sensitivity of this monitoring in the diagnosis of air embolism.

References

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