CORRESPONDENCE

HALOTHANE–TRICHLOROETHYLENE COMBINATION: A REAPPRAISAL

Sirs,—The objective of this letter is once again to bring this method of anaesthesia to the notice of readers as we feel it has the following advantages:

(1) Simple method with almost a “standard setting” of 0.5 per cent halothane and minimal trichloroethylene for a majority of operations when full muscular relaxation is not required.

(2) Rapid production of analgesia so that a painful procedure can be started sooner than with nitrous oxide, oxygen and halothane alone; some degree of analgesia in the immediate postoperative period.

(3) Certainty of a considerable saving in the national halothane bill, estimated by Briscoe (1970) to be £900,000 during the year 1967/68 (not including dental anaesthetics).

(4) Reduced risk of cardiovascular complications due to overdosage of halothane.

The method consists of the use of nitrous oxide, oxygen and halothane (Fluotec next to the Rotameters) in a semiclosed system. An initial strength of 1–2 per cent halothane may, within a very few minutes, be reduced to 0.5 per cent in the majority of cases. This is due to the early or immediate addition to the circuit of minimal trichloroethylene (25 ml or less in the bottle, plunger fully up and the lever at a point where the trichloroethylene is just detectable by smell when tested previously).

The concentration of halothane developing in the trichloroethylene bottle was charted, following analysis by gas chromatography, in our earliest communication. The somewhat haphazard olfactory method of estimating minimal trichloroethylene concentration is obviously open to criticism, but in practice works well. Moreover, trichloroethylene bottles are available everywhere and easy to clean out. However, we are indebted to Dr D. A. Needham, Director of Research, Messrs Cyprane Ltd, for the following information: “As far as we can determine in the laboratory the threshold of olfactory detection appears to be about 0.1 per cent Trilene (but this is based on only two noses). A Tritec can be used to deliver this concentration at its lowest setting and would be expected to maintain this between ±0.05 per cent Trilene.”

This simple method was reported by us independently in 1966 (Pilberg and Vellacott) and in 1968 (Scott), since when the following clinical experience has accumulated.

Two of us (O.P. and W.N.V.) have given over 5,000 halothane/trichloroethylene anaesthetics at the Worcester Royal Infirmary and continue to prefer this method except in the very young and in cases requiring full relaxation. Wolfson (1970 personal communication) writes that he and some of his colleagues at the Birmingham Accident Hospital have adopted this technique and while he “has no idea of the numbers involved, they must run into thousands”. He has personally had no mishap with this technique and regards it as “almost certainly the safest way of using halothane”. Another of us (D.L.S.) uses this method for many procedures not requiring full muscular relaxation (unless a longer operation in a particularly robust patient is planned, when he prefers a relaxant + IPPV technique). He is particularly impressed with the way that patients “settle” following cord-spraying and intubation.

Originally two of us (O.P. and W.N.V.) suggested a maintenance position on the Mark 2 Fluotec with the dial halfway between 0.5 per cent and zero. The possibility of difference in concentration of such a setting on the Mark 3 Fluotec prompted a letter to Messrs Cyprane Ltd to find out the exact effect of such a setting in the case of both vaporizers. Dr D. A. Needham has given us the following information (September 1970):

“Fluotec vaporizers are calibrated over the range 0.5 per cent up to the maximum setting. Below the 0.5 per cent mark the Fluotec 2 and Fluotec 3 vaporizers behave differently.

“In the Fluotec 2 the delivered concentration falls linearly as the dial is turned below the 0.5 per cent mark until a minimum is reached immediately before the ‘off’ position, at which point the control valve springs to the closed position and the output drops to zero. In a recent series of tests at room temperature and a flow rate of 5 l/min, the minimum recorded concentration delivered was 0.34 per cent on a very early vaporizer. The concentration delivered at a point midway between ‘off’ and 0.5 per cent is generally in the region of 0.45 per cent.

“In the Fluotec 3 the delivered concentration falls almost linearly to zero, which is reached when the dial is rotated about 12° below the 0.5 per cent mark. The 0.5 per cent mark is about 36° from the ‘off’ mark. Thus, the concentration delivered at a position midway between ‘off’ and 0.5 per cent is zero.”

We thus conclude that the clinical use of a dial setting below 0.5 per cent on either the Mark 2 or 3 Fluotec should be abandoned.

Nobody, we suppose, knows just how vast majority of anaesthetics “with a spontaneously-breathing patient” are given in this country. Our guess is that, for well over 50 per cent, nitrous oxide, oxygen and halothane is used in a semiclosed circuit. It is especially, but not entirely, for those using this technique that we believe we have something to offer.

Briscoe (1970) stresses the great saving provided by the use of the “closed” circuit, using flows of 2 l/min or less, but we consider that Briscoe’s technique requires much more care and attention than the one we recommend, and might therefore be considered less safe. Moreover, the closed circuit would preclude the use of trichloroethylene. The minimal addition of which seems to give our technique advantages over nitrous oxide, oxygen and halothane alone.

We believe that the method described provides a safe and smooth anaesthetic which gives a reasonable degree of economy and is worth careful consideration.

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REFERENCES

