PHENYLEPHRINE
A VASOCONSTRICTOR FOR USE DURING HALOTHANE ANÆSTHESIA

By H. A. CONDON (London)

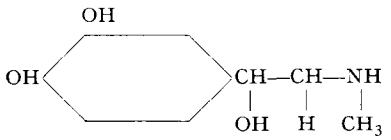
THE introduction of Halothane into clinical anæsthesia has proved to be a major advance. This agent is now widely used and is particularly suitable for anæsthesia for otorhinolaryngology. The reasons for this popularity are (i) it is non-explosive, (ii) it does not irritate the respiratory tract, (iii) salivary and bronchial secretions are diminished, (iv) bleeding is reduced, (v) induction and recovery are both rapid, and (vi) there is a low incidence of post-operative vomiting.

The possibility of ventricular fibrillation occurring as a result of the injection of adrenaline during halothane anæsthesia was recognized from the outset (Brindle *et al.*, 1957; Millar *et al.*, 1958). Later reports suggested that such use of adrenaline had no untoward effect (D'Arcy *et al.*, 1959), and it would appear that local infiltration with adrenaline during halothane anæsthesia is widely practised.

Recent reports of four episodes of cardiac arrest in these circumstances (Rosen and Roe, 1963; Varejes, 1963; de Lange, 1963) suggested that such methods should be reconsidered. Although Pronethalol is now available to control ventricular arrhythmias caused by adrenaline (Johnstone, 1964), the principle of prevention is surely preferable to treatment of the established condition.

A clinical trial using phenylephrine as a vasoconstrictor was therefore started. This drug is a synthetic sympathomimetic amine and was first described by Kuschinsky and Oberdisse in 1931. Its structure and that of adrenaline are as follows:

ADRENALINE



PHENYLEPHRINE

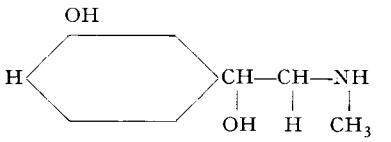


FIG. 1.

Phenylephrine is considered not to increase the irritability of the myocardium (Wylie and Churchill-Davidson, 1960), although there may be bradycardia from

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vagal stimulation. There have, however, been isolated reports of cardiac irregularities when this substance is used as a vasopressor agent during halothane anæsthesia in dogs (Loehning and Czorny, 1960) and man (Wyant *et al.*, 1958; Catenacci *et al.*, 1963). There is no evidence of a central stimulant action.

Phenylephrine has been used with satisfaction to produce local vasoconstriction in general, orthopædic and gynæcological surgery, being used in a 1 in 20,000 solution. The widespread use of cartridge syringes has prevented its introduction into otorhinolaryngology, but suitable cartridges are now available. It should be noted that phenylephrine cannot be autoclaved.

In a series of patients anæsthetised with halothane by the author, phenylephrine has been used as a local vasoconstrictor. The operations have been standard procedures, e.g. S.M.R., mastoidectomy, stapedectomy. There is no readily available method for the quantitative comparison of blood loss during this type of surgery. However, vasoconstriction has been obtained which, in association with the moderate hypotension of halothane anæsthesia, has produced a reasonable operating field. In some cases the phenylephrine has acted as a vasopressor and a transient rise in blood pressure has been noted. E.C.G. studies have not shown any arrhythmia developing after the infiltration.

Conclusion

The infiltration of adrenaline during halothane anæsthesia is potentially dangerous. Surgeons and anæsthetists must jointly decide if this practice continues to be justified, now that a safer alternative, phenylephrine, is available. Safety must come before all other considerations.

Acknowledgments

I am indebted to Professor D. F. N. Harrison and Mr. Henry Shaw for their co-operation.

Cartridges of phenylephrine are obtainable from Boots Pure Drug Co. Ltd.

REFERENCES

Brindle, G. F., Gilbert, R. G. B., and Millar, R. A. (1957) *Canad. Anaesth. Soc. J.*, **4**, 265.

Catenacci, A. J., DiPalma, J. R., Anderson, J. D., and King, W. E. (1963) *J. Amer. med. Ass.*, **183**, 662.

D'Arcy, E. J., Holmdahl, M. H., and Payne, J. P. (1959) *Brit. J. Anaesth.*, **31**, 424.

Johnstone, M. (1964) *Brit. J. Anaesth.*, **36**, 224.

Kuschinsky, G., and Oberdisse, K. (1931) *Naunyn-Schmiedeberg's Arch. exp. Path. Pharmak.*, **162**, 46.

de Lange, J. J. (1963) *Anaesthesia*, **18**, 537.

Loehning, R. W., and Czorny, V. P. (1960) *Canad. Anaesth. Soc. J.*, **7**, 304.

Millar, R. A., Gilbert, R. G. B., and Brindle, G. F. (1958) *Anaesthesia*, **13**, 164.

Rosen, M., and Roe, R. B. (1963) *Brit. J. Anaesth.*, **35**, 51.

Varejes, L. (1963) *Anaesthesia*, **18**, 507.

Wyant, G. M., Merriman, J. E., Kilduff, C. J., and Thomas, E. T. (1958) *Canad. Anaesth. Soc. J.*, **5**, 384.

https://doi.org/10.1017/S0022215100063532 Published online by Cambridge University Press

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WYLIE, W. D., and CHURCHILL-DAVIDSON, H. C. (1960) A Practice of Anaesthesia. London.

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