HISTOLOGICAL FINDINGS FOLLOWING INTRATHECAL INJECTION OF PHENOL SOLUTION FOR RELIEF OF PAIN

Sir,—Over the last two years I have treated more than 80 patients with phenol injected intrathecally, and I am surprised by the very high percentage (100 per cent) of posterior column damage which Dr. Marion Smith reported in her paper (Brit. J. Anaesth. (1964), 36, 387).

Before reading this paper I had the impression that such damage was not a frequent complication of the technique. I was puzzled when, two months ago, following a dose of 0.4 ml phenol and glycerol injected between the second and third thoracic vertebrae in a patient with breast cancer, a neurological complication subsequently developed in both lower limbs. This consisted of hypoalgesia, muscle weakness, diminished reflexes and loss of proprioception in the left leg. The patient recovered from all except one of these complications.

There seemed to be no relationship between the level of the injection (the injection was carried out with the patient almost horizontal) and the level of the neurological complication which developed below the tenth thoracic segment. It was thought that a vascular factor was involved. This patient was the only one of the 80 cases with impairment of proprioception. Forty-five of these patients had had injections involving roots directly related to limb movement.

I wish to comment on another point. There is evidence, as shown by the histological findings of Smith and others, that phenol is not a selective neurolytic agent; that it destroys every type of fibre irrespective of diameter or myelinization. Clinically in most instances, however, it does not seem that phenol behaves in such a manner. For instance, in non-malignant diseases such as post-herpetic neuralgia and arthritis of the spine, I have never seen a muscular paralysis complication. These have occurred most often when cancer was the cause of the pain subjected to phenol blockade. I think it would be most interesting to know the clinical pictures of the 16 patients whose spinal cords were examined by Dr. Smith and to have the conclusions of such comparison. For clinicians such as myself (an anaesthetist) the actual findings of a postmortem examination are most interesting from a scientific and clinical point of view, but from a practical one I think it would be most useful to know what was the clinical picture corresponding to these pathological findings. If every patient in whom phenol is injected develops neurological complications in accordance with the histological picture described it is necessary to consider seriously whether it is appropriate to continue to use intrathecal phenol in treating chronic pain. I feel that loss of proprioception is too high a price to pay, at least in some cases.

Methohexitone followed by nitrous oxide with not less than 20 per cent oxygen and without halothane.

The main differences between the teaching and practice of 1961 and that of today could be summarized as follows:

1. The anaesthetic machines are set to deliver 20 per cent oxygen from the start, and this setting is not altered except occasionally to be increased. Asphyxial methods, e.g. induction and/or maintenance with less than 20 per cent oxygen are today condemned. The apparatus is frequently tested for accuracy.

2. Trichloroethylene, ethyl chloride and thiopentone are not used, while halothane and methohexitone are used more frequently.

CORRESPONDENCE

CEREBRAL VASOCONSTRICTION

Sir,—It would appear that Professor Robson’s statement in his article on acute hypoxia (Brit. J. Anaesth. (1964), 36, 536) that cerebral blood vessels constrict in the presence of a raised Po2 may be incorrect. From the well documented work by Lambertsen, it was shown that when hypopcapnia is avoided by the addition of carbon dioxide so as to maintain alveolar Po2, cerebral vasoconstriction does not take place.

A. G. LARSON
Sussex

REFERENCE


ANÆSTHESIA AT THE ROYAL DENTAL HOSPITAL

Sir,—Dr. W. D. A. Smith is to be congratulated on his methodical study of 410 anaesthetics given at the Royal Dental Hospital during August 1961 (Br. J. Anaesth. October/November 1964), as well as for the original idea which impelled him to undertake the study, and for the construction of the necessary and very ingenious apparatus.

As may well be imagined, its results, communicated to the Consultant Anaesthetic staff at intervals during the intervening period, have had an incalculable effect upon the anaesthetic teaching and practice at that institution. It is therefore a pity that publication has been so long delayed since methods have changed so completely in the meantime, so that as an “investigation of . . . what anaesthetic techniques were actually practised in a reputable teaching centre and the reaction of patients to these techniques”, this study is now completely out of date and is possibly of historical interest only.

Of the fifteen methods stated as being in use in 1961 only four are in use today, viz.: Nitrous oxide with not less than 20 per cent oxygen with or without halothane. Methohexitone followed by nitrous oxide with not less than 20 per cent oxygen with or without halothane.

Since the publication of the article, the Royal Dental Hospital has had an anaesthetic machine.
(3) The tension on the expiratory valve is kept as low as possible, the spring being removed wherever the design of the valve makes this possible.

(4) Nosepieces using twin narrow-bore tubing have been discarded in favour of wide-bore (Goldman or Blair Gould) patterns.

Since your readers might gain a false idea from reading Dr. Smith's articles, it is only fair to emphasize that dextran has been in use since 1961, and for which Dr. Smith's work has been in large measure responsible. These changes have had profound effects (not always beneficial) on the work of the department, but this is another story.

R. Blair Gould
London

DIALLYL TOXIFERINE

Sir,—I have read with interest Dr. Hunter's paper on diallyl toxiferine which appeared in the August number (Brit. J. Anaesth., 36, 466). I have used Alloferin in some 400 patients over a period of two years and I hope to publish my findings in due course. I find it hard to agree with some of Dr. Hunter's conclusions regarding the properties of the drug.

It has been my practice to use a standard dose of 10 mg for the average patient together with 80–100 mg of methohexitone as an induction agent and this gives good conditions for intubation using the technique described by Dr. Hunter in his paper, i.e., 2 minutes' inflation with gas and oxygen subsequent to the giving of the relaxant. I would say that the 10-mg dose gives as good conditions for intubation as does 30 mg tubocurarine. I have found that it is only occasionally necessary to increase the dose to 15 mg in the resistant patient. All my patients were on controlled ventilation and where a topping-up dose of diallyl toxiferine was required 5 mg was used, this dose being repeated at half-hourly intervals where the length of the operation required it.

The impression that diallyl toxiferine manifests a cumulative effect appears to be an illusion. A preliminary investigation using the electromyograph shows that whichever non-depolarizing muscle relaxant is used, be it gallamine, tubocurarine or diallyl toxiferine, a second dose given as much as 14 hours after the first dose has a relatively greater effect than the initial dose. This is due to the exponential decay of any of this group of drugs and there is always a residual effect persisting for some hours, however short the main paralyzing action may appear to be. Strictly speaking, I do not consider that this can be regarded as a cumulative effect. In my opinion, the major advantage of Alloferin is the ease with which it can be reversed by neostigmine and a topping-up dose of 5 mg for the closure of the abdomen can always be reversed immediately afterwards. In my view, less neostigmine is required to reverse Alloferin than is normally required for the reversal of tubocurarine, 10 mg of Alloferin normally being reversed by 1.25 mg of neostigmine in my series of cases.

I have, in fact, been so impressed by the reversibility of Alloferin that I have used it as the drug of choice in all cases in which I feel that neostigmine resistance might be a hazard. With regard to the effect on blood pressure, while some fall does occur in some patients, this is not sufficient to cause anxiety and I feel that it is the drug of choice in cases of intestinal obstruction where induction in the head-up position is necessitated. In short, Alloferin appears to me to be the drug of choice in those patients who fall into the poor-risk category.

As a point of interest, methohexitone and Alloferin are miscible and can given in the same syringe, whereas thiopentone and Alloferin will not mix.

P. H. Venn
Eastbourne

BOOK REVIEWS

Shock. Edited by S. G. Hershey, Professor of Anesthesiology, New York University Medical Center; with 27 contributors. Published by J. & A. Churchill Ltd., London. Price £4 2s. 6d.

"Shock" is an imprecise term, and to define it as a "resistance disease of adaptation" scarcely helps. The cynic says, "Shock is the state from which patients finally succumb if a number of other conditions go untreated," but the fact is that irreversible shock can be induced and studied with some precision in the animal laboratory. Haemorrhage, and the injection of certain endotoxins, lead predictably to untreatable circulatory failure, and are therefore used in experiments designed to delay or prevent irreversibility. Irreversible shock secondary to haemorrhage is a rarity in patients, except in wartime, while in any event the condition can hardly be diagnosed in a living patient. Clinicians murmur, perhaps with justification, that a condition can hardly be diagnosed in a living patient.

The book begins with an account of the (positive feedback) vicious cycles which lead to irreversible shock; Crowell and Guyton emphasize the oxygen debt incurred, and believe that cardiac dysfunction (with phenoxybenzamine, and the circulatory effects of this, brings temporary benefit, while adrenergic blockade inevitably harmful, low molecular weight dextran being repeated at half-hourly intervals where the length of the operation required it.

The apogee of the book, the largest section (66 pages), and a good starting point for the reader, is "The Nature of Experimental Irreversible Shock with its Clinical Application," from the Minnesota surgical group. This is a model presentation of well-organized research, persuading the reader by clarity rather than oversimplification that the mechanism of irreversible shock is unmysterious, but does result from vasocostriction and tissue ischaemia. While in the dog the critical area is the intestine and splanchnic circulation, this does not exclude the same mechanism in a different visceral area in other species. Vasoconstrictors are inevitably harmful, low molecular weight dextran brings temporary benefit, while adrenergic blockade with phenoxybenzamine, and the circulatory effects of large doses of adrenocorticoids, have brought most success both experimentally and clinically.

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P. H. Venn
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