

Anaesthesia: Considerations for Polio Survivors

Polio Network News: Dr. Spencer, we have received several requests for information concerning "the danger of administering certain anaesthetics to polio survivors." Please clarify the issues.

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The problem is not straightforward, but our experience is described in *Perioperative care in restrictive respiratory disease*, J.A. Patrick, M. Meyer-Witting, F. Reynolds and G.T. Spencer, *Anaesthesia*, 1990, Volume 45, pages 390-395. The article suggests that with suitable modification to take account of the disability, general anaesthesia is no more dangerous for people who had polio than it is for anybody else, and our views are summarized in the conclusions.

There is a fundamental difference between British anaesthetic practice and that of the States. We do not have nurse anaesthetists; all anaesthetics are administered by doctors. We believe that administration of anaesthetics by nurses substantially alters clinical practice in that techniques have to be standardized and routines established. This tends to make it more difficult to go back to basic considerations and modify techniques to meet particular needs.

Special considerations for polio survivors can be grouped roughly into three categories: those resulting from the general effects of polio, those resulting from respiratory insufficiency as a result of polio, and those resulting from the surgery to be undertaken.

Special consideration for polio survivors resulting from the general effects of polio

Patients with significant paralysis from polio have a greatly reduced muscle mass. Muscle normally contains a great deal of blood and requires a substantial blood supply to function. If much of that mass is lost, the total blood volume is greatly reduced, and such patients react to haemorrhage as does a small child. This necessitates precise and complete replacement of blood lost during surgery. Most patients with polio replace lost muscle with fat. Very few remain as thin as they were immediately after the acute illness. Fat contains a smaller proportion of water than does muscle, so the effects of water loss are more quickly apparent and electrolyte disturbances, particularly potassium loss, require careful and precise balance and replacement.

Special consideration for polio survivors resulting from the respiratory effects of polio

Most general anaesthetics depress breathing. Mechanical respiratory assistance, during and after anaesthesia, in polio patients whose breathing is even mildly

affected by polio is essential. It often needs to be maintained for longer, postoperatively, than would be necessary in a non-polio patient undergoing a similar operation. Most postoperative painkillers also depress breathing and need to be used with caution. Surprisingly, perhaps, this is not as much of a disadvantage as it sounds. A great deal of postoperative pain is due to muscle damage caused by surgery. If muscles are absent or weak, pain is proportionately less severe, and the need for painkillers is thereby reduced.

Special consideration for polio survivors resulting from the effects of surgery

Many surgical operations require the passage of an endotracheal tube, either for surgical access or to allow artificial ventilation to be performed. Removing the endotracheal tube at the end of the operation and re-establishing adequate spontaneous ventilation is often a problem. It is in this situation that the use of an iron lung can be of particular value for at least a short time until the patient is able to return to his normal methods of respiratory assistance.

The use of particular anaesthetic agents is less significant than the overall anaesthetic technique employed. In general, however, it is desirable and usually possible to avoid the use of muscle relaxant drugs. The polio muscle weakness usually renders them unnecessary, and it is usually impossible to reverse the action of these drugs completely and immediately. Residual effects tend to persist for some hours, and this can be a disadvantage for patients who need to use as much muscle strength as they possess in order to keep breathing adequately.

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