

PREANESTHETIC HYPNOSIS WITH RECTAL PENTOTHAL IN CHILDREN *

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JACKSON (1) has demonstrated a causal relationship between pre-operative apprehension and tachycardia during pediatric anesthesia. She concluded that in order to maintain a more nearly physiologic pulse rate during anesthesia in children, it is advisable to bring them to the operating room free from fear. The present study was undertaken to develop a simple yet practical method for attaining this end.

METHOD

Sodium pentothal in 10 per cent solution was administered rectally thirty minutes before the scheduled time of operation to 100 children ranging in age from 10 months to 11 years. Accurate dosage was employed, based on a standard of 1 Gm. per 75 pounds of body weight. As with other drugs which are administered rectally, appropriate consideration was given when the patient's weight or metabolic rate was abnormal. An arbitrary maximal dose of 1 Gm. was chosen. A simple cleansing enema was given the night before. Preoperative hypodermic medication was routinely employed. In the first 17 cases, this was given after the rectal pentothal had taken full effect; in the remainder of the series it was given fifteen to thirty minutes before the pentothal. The drugs so employed were codeine sulfate, 30 to 60 mg. with atropine sulfate, 0.4 mg., in 13 patients; atropine sulfate alone, 0.2 to 0.3 mg., in 5 patients; demerol, 5 to 50 mg. with atropine sulfate or scopolamine hydrobromide, 0.2 to 0.3 mg., in 36 patients; and demerol alone, 10 to 50 mg., in 46 patients. The 10 per cent solution of sodium pentothal was freshly prepared and the prescribed dose measured out into an individual container. At the proper time the drug was introduced into the rectum. The only apparatus required was a syringe of 10 cc. capacity fitted with a metal syringe tip adapter for the attachment of a soft rubber catheter, size 10 French. The internal capacity of the catheter was measured and found to be 1 cc. This extra amount of 10

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per cent sodium pentothal solution was added to each individual dose prepared. Upon completion of the instillation the catheter was withdrawn from the rectum, still attached to the syringe in order to retain its intrinsic volume of solution. Precision of dosage was thus ensured.

One of us (L. C. M.) administered the rectal pentothal to the first 31 patients and supervised their transportation to the operating room. With the safety of the procedure established, this responsibility was delegated to the nursing staff on the ward, the anesthesia service providing in advance the doses prescribed.

Gentle, quiet handling of the children was stressed on the wards, in transit and in the operating room. The anesthetic agents and technics employed were cyclopropane, 48 patients; ether by open drop, oropharyngeal or endotracheal insufflation, 44 patients; nitrous oxide and oxygen, 6 patients; procaine hydrochloride 2 per cent by local infiltration, one patient; and no anesthesia (for change of plaster of Paris cast), one patient. Of the operative procedures, 37 per cent were orthopedic and 63 per cent were general surgical interventions. Operating time varied from seven minutes to two hours, with an average duration of forty-two minutes.

RESULTS

Sixty-six per cent of the children in this series were asleep within five to fifteen minutes after the rectal pentothal instillation. The 34 per cent who did not fall asleep became drowsy, quiet and submissive. Painful stimuli such as that provided by a hypodermic injection roused the sleeping children resentfully, but upon being reassured they promptly returned to sleep. For this reason the original procedure was modified so that the preoperative hypodermic medication preceded the rectal pentothal. Preoperative cleansing enemas, at first optional at the direction of the surgeon, were ordered routinely when 2 children expressed desire for evacuation shortly after pentothal administration, two others partially expelled the solution, and still another two defecated on the table during operation. A full hypnotic effect was achieved in all 6 patients. One child began to retch and complain of abdominal pain after pentothal; upon being reassured, he went quietly to sleep. Coughing and sneezing after administration of pentothal occurred in one child who fell asleep within five minutes. Early in the series, a 3-year-old child developed an atropine flush after receiving codeine sulfate, 30 mg., and atropine sulfate, 0.4 mg. Following this occurrence, demerol and smaller doses of atropine or scopolamine were employed. Finally the belladonna drugs were eliminated entirely when demerol was used. Demerol, it is recalled, has some parasympathetic depressant effect, of which diminution of pharyngeal and tracheobronchial secretions is one manifestation (2).

Transfer to the operating room and induction of anesthesia evoked no response in 73 per cent of the sleeping children. The remaining 27

per cent of this group responded to the stimulation of handling or induction by squirming feebly in their sleep or by opening their eyes questioningly. Upon gentle reassurance they submitted quietly. Similarly, with the children who were awake but drowsy, gentle, quiet handling achieved full cooperation without disturbance and without display of fear.

One child of 4 years who fell asleep seven minutes after administration of pentothal developed mildly stertorous respiration. None of the children demonstrated any difficulty in maintaining a free airway: the problem of asphyxia was nonexistent. Respiratory depression did not occur.

The average maintenance pulse rate (i.e., the average of frequent pulse readings recorded during surgical intervention) for this series of 100 cases was found to be 120.1 per minute. For the 76 children 6 years of age and younger this rate was 124.4 per minute, while for the 24 children 7 years of age and older it was 109.9 per minute. For comparison with these figures the 108 cases studied in this hospital by Jackson serve admirably as a control group (1). Those children came from the same hospital wards, underwent similar operative procedures and were handled by practically the same nurses, surgeons and anesthesiologists. The over-all average maintenance pulse rate for that group was 141 per minute; for the 46 children 6 years old and under the rate was 157 per minute; and for the 62 children from 7 to 12 years old it was 129 per minute.

Complications during anesthesia were few. Minor degrees of stridor were encountered in 7 patients receiving cyclopropane; in one child this was sufficiently disturbing to warrant endotracheal intubation. In 11 cases in which ether was employed, too rapid an increase in vapor concentration resulted in stridor which subsided when the insult was abated. Bronchospasm occurred twice during cyclopropane anesthesia but cleared promptly when small amounts of ether were added. Excessive mucous secretion requiring suction of the air passages was observed in 14 patients.

No postoperative complications were attributable to rectal pentothal. Those encountered included one case of each of the following: transient hiccup during emergence; respiratory obstruction from aspirated vomitus, which cleared with suction of the upper air passages; laryngeal edema and bronchopneumonia following endotracheal intubation for repair of cleft palate; urticaria from sensitivity to adhesive tape; and convulsions on the second postoperative day in a child with spastic tetraplegia.

COMMENT

Ideally, proper handling of the young patient and psychologic preparation for surgery would eliminate fear and should render not unpleasant the experience of hospitalization. The application of these

principles in a children's hospital has been described in some detail by Beverly (3). Probably all hospitals will ultimately gear the management of their pediatric wards to these requirements, but economic and personnel factors usually hinder the full achievement of this goal.

Pharmacologic control of preoperative apprehension is more immediately applicable. Preoperative medication for psychic sedation is a useful adjuvant to proper psychologic handling; when the latter is less than perfect, the former becomes mandatory. Asworth has declared that "except in case of urgency, . . . no conscious child should ever see the (operating) theatre or be submitted to the terrors associated with the induction of inhalation anesthesia," (4) while Mallinson has proposed, "the ideal to be aimed at is that the child should fall asleep before operation and awaken again afterwards in its own bed" (5). Chloral hydrate, paraldehyde, avertin and various barbiturates have each been advocated to accomplish this end (4; 6-14); the rectal and oral routes of administration have been favored. Sodium pentothal rectally in the dosage recommended here possesses the following advantages: (1) selective, cortical action, (2) rapidity of onset, (3) short duration, (4) low toxicity, (5) minimum of side effects, and (6) ease of administration. Gauged by these criteria, chloral hydrate, paraldehyde and avertin are quickly eliminated from consideration as being too toxic, too depressant and too long-acting, while barbiturates other than the ultra short-acting group are too long-acting.

Preanesthetic hypnosis rather than basal narcosis is achieved with the dosage of rectal pentothal described. The nursing personnel can thus safely administer the prepared doses to their young patients. Constant attendance upon the children nevertheless is essential. One little girl, not fully under the influence of pentothal and briefly unattended while the nurse answered the telephone, clambered out of the bed and was swaying drowsily across the room when the nurse returned. Because of the low dosage employed, gentle quiet handling is necessary. Painful stimuli rouse the sleeping children momentarily until the disturbance has passed. Similarly, the induction of ether anesthesia requires judicious administration to avoid too rapidly increasing the concentration of irritant vapor striking the upper respiratory passages.

Demerol in the dosage suggested by Leigh and Belton (15) affords adequate opiate premedication. In addition, by virtue of its belladonna-like activity, demerol minimizes the need for scopolamine or atropine for the prevention of secretions in the upper respiratory tract. For this reason, too, cyclopropane seems the inhalation agent of choice by virtue of its minimal irritant properties.

The popularity of this method seems assured in our hospital. Just as adult patients frequently request intravenous pentothal induction, so now do the children ask for rectal pentothal ("For my operation can I have the same thing you gave Richard?"). Nurses and surgeons appreciate the facility of handling of children coming to the operating

table. The anesthesiologist is pleased at the reduction in pulse rate to more nearly physiologic levels and also at the greater ease of anesthetic management.

SUMMARY

Preoperative apprehension in children can be eliminated by rectal pentothal hypnosis. The result is a more nearly physiologic pulse rate during anesthesia. Sodium pentothal in 10 per cent solution is employed in precise dosage of 1 Gm. per 75 pounds of body weight. This results in neither anesthesia nor basal narcosis, but does produce preanesthetic hypnosis. Consequently, the ward nurses may safely administer rectal pentothal in the prescribed amounts. Omitting barbiturates, other premedicants may be utilized in the usual doses, together with the desired anesthetic agents and technics. For inhalation anesthesia, adequate doses of demerol, rectal pentothal and cyclopropane would seem to be a suitable combination.

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