THE USE OF RECTAL THIOPENTAL FOR PRE-ANAESTHETIC HYPNOSIS (CASES 1947-1961)

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AMONG THE MILESTONES of modern anaesthesia, we must place the clinical introduction of thiopental sodium by Lundy in 1934¹ with the foremost. A quarter of a century has passed, and this drug has run the gamut of uses. This has included its use as a primary agent with no supplementation, or with oxygen and a relaxant when needed, for patients of all ages and all risks. At the other extreme, some have used thiopental for the induction, or basal, anaesthesia in selected cases only, and not as a primary agent. Today, most anaesthetists assign it to a role somewhere between these two extremes.

Thiopental has been employed most widely intravenously. The rectal route, however, is an excellent and safe method.^{2,3,4} This paper will report on its rectal use in paediatric cases at St. Joseph's Hospital, Victoria, B.C., since 1947.

Basal anaesthesia using thiopental has been described as requiring a dose of 20 mg. per pound of body weight.^{5,6,7} Basal anaesthesia would be indicated by a patient deeply asleep, who would respond to supra-orbital pressure, but would not awaken. There would be complete muscular relaxation in the absence of painful stimuli. The pupils would be centrally fixed. The eyelid reflex would be gone, and the corneal and light reflexes would be intact. A similar state would probably be achieved with tribromethanol in the 80 mg. per kilogram dosage range.

Pre-anaesthetic hypnosis can be attained by employing thiopental rectally, with a dose of 10 to 15 mg. per pound of body weight. This state would suggest a patient lightly asleep, who rouses resentfully to painful stimulation, but who drops back to sleep when permitted. The eye signs would not be characteristic. This paper describes how we have used rectal thiopental for pre-anaesthetic hypnosis in paediatric patients coming to the operating theatre for all types of surgical procedures requiring inhalation anaesthesia.

The age range was primarily from 1 to 8 years. A few children were in the 3 to 12 month age group, and a few children were 8 to 11 years. It was not employed in patients under 20 pounds, in most instances, nor in many over 70 pounds. Exceptions occurred, but they were few. We considered that the older and heavier children could easily take oral pentobarbital or secobarbital for sedation. In the smaller and younger infants it was felt that they could be sufficiently and more safely sedated for inhalation induction by hypodermic injection. In addition, the psychic effect of going to the operating room and being induced is probably minimized in these babies.

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The evening prior to surgery, the anaesthetist sees the patient, and leaves orders. An order for h.s. sedation is left. This is usually a nembutal suppository, from one-quarter to three-quarters of a grain depending on weight. Children who are crying after admission to the ward usually receive this around 5 or 6 p.m. It may be repeated, although it is rarely necessary, as the majority settle down quickly. If they are relaxed and happy, this sedation is unnecessary. An enema is not given h.s. or in the morning, as we have found it unnecessary, even though we use relatively large amounts of dilute solution, i.e. up to 35 cc. of a 2 per cent solution. A hypodermic sedative is ordered for 1 hour preoperatively. The dosage range here for morphine or meperidine in conjunction with a belladonna derivative follows closely the table in Leigh's and Belton's textbook.⁸ Rectal thiopental 2 per cent solution is ordered to be given 20 minutes preoperatively, $\frac{1}{2}$ cc. per pound of body weight (i.e., 10 mg. per pound of body weight). Adjustments in dosage are made with abnormalities in weight or metabolic rate.

Once the order has been written, the night nurse on the paediatric floor copies this onto a small card, which is then affixed to a 3-ounce, sterile, screw-cap medicine bottle. Information on the card includes the child's name, age, operation to be performed, room number, doctor's name, date of operation, child's weight in pounds, and pre-anaesthetic barbiturate (i.e. rectal thiopental 2 per cent solution, number of cc., and time it is to be given). These empty bottles, with affixed cards, are taken to the operating room during the night shift, and each one is filled with the amount ordered from the stock of 500-cc. bottles of 2 per cent thiopental. These stock bottles are made up daily by one of two specific nurses in the operating room. There is only one strength, i.e. 2 per cent solution for intravenous or rectal use, and this we feel has been the prime factor in eliminating errors in dosage. We know of one case where 400 mg. of thiopental was to be given to a 20-pound baby (i.e. 20 mg. per pound), and by error 2,000 mg. was given. In this instance a 5-gram ampoule was mixed instead of a 1-gram ampoule, and a gross overdosage resulted. This type of error is virtually impossible using a 2 per cent solution. Even doubling our dose would only achieve basal narcosis.

It might be argued that by giving a nembutal suppository h.s. or preoperatively and a larger dose of morphine, an equally quiescent child would arrive for induction. Our experience has been that, with very few exceptions, the child given rectal thiopental arrives in the operating room sleeping. This is usually not the case when a hypodermic of morphine and scopolomine is given alone. The older children receiving oral barbiturate plus hypodermic morphine and scopolomine may, or may not be sleeping on arrival in the operating room.

The thiopental is given 20 minutes preoperatively on the floor by the head nurse, and after administration constant supervision is maintained. Patients may have relaxation of tongue and jaw, and constant observation is mandatory. An aide from the operating room comes down, and accompanies the nurse and sleeping child in its crib to the operating room. Resuscitative equipment should, of course, be readily available on the paediatric floor. The crib is placed outside the room booked for surgery, and a careful surveillance is maintained until the child is carried into the operating room. They will usually arouse at this point, but fall back to sleep on the table.

Induction is by mask employing a gravity method for a few breaths. An excitement stage is indeed rare. Most cases are done with a closed technique employing a circle absorber and Revell Circulator,^{9,10,11} the remainder on a semi-closed system. Methods for intubation and maintenance vary with the individual anaesthetist.

All agents, including cyclopropane, ether, nitrous oxide, halothane, and succinylcholine, in various combinations have been employed. Surgical anaesthesia is well tolerated, and we have had few cases in which there was depression from the premedication regime.

Many advantages accrue from using rectal thiopental in this fashion. Induction is smooth, and the condition during maintenance is entirely satisfactory. The postoperative emergence is usually smooth with no delirium, and with minimal nausea. We have not analysed the incidence of postoperative nausea and vomiting, as maintenance agents and the operation itself influence this greatly. Many children in the postanaesthetic recovery room following tonsillectomy will vomit regardless of the agents used, if they are swallowing small amounts of blood.

The great benefit of rectal pre-anaesthetic hypnosis lies in the fact that the child remembers little or nothing of his trip to the operating room. The psychic advantages of this have been reviewed by Eckenhoff^{12,13} and others. An uneventful induction is easier on the patient, the anaesthetist, and the operating room staff. We believe that thiopental is safer than tribromethanol, in that it is not toxic to liver or kidney. There is little or no irritant action on the rectum, and the profound respiratory and cardiovascular depression seen with avertin is seldom seen. It is also easier to administer than avertin.

The contraindications are few. We would not give this agent in cases of respiratory embarrassment from any cause, or in cases of profound anaemia. It can be used in patients with cardiac disease (e.g. for cardiac catheterization), but of course care must be exercised. Few children have inflammatory disease of the annus, rectum, or colon so that contraindication is indeed rare.

Rectal thiopental has been used at St. Joseph's Hospital in Victoria in this fashion since 1947. The total number of administrations to date in this series is 10,153. During this large series, we have had no case of respiratory depression severe enough to cause the anaesthetist concern, or to require any remedial measures. The maximal effect is about 15 minutes after administration, when the child is arriving in the operating room. The thiopental should be metabolized completely by the time he arrives in the postanaesthetic recovery room (i.e. usually 45 minutes or more).

CONCLUSIONS AND SUMMARY

Since 1947 rectal thiopental 2 per cent in a dosage of 10 mg. per pound of body weight has been used at St. Joseph's Hospital, Victoria to achieve pre-anaesthetic hypnosis in more than 10,153 paediatric cases. We have found this method to be safe, reliable, and relatively easy to institute on the paediatric ward. It confers psychological advantages upon patient, anaesthetist, attending staff on the ward and in the operating room, and upon parents. Mortality has

been nil, and morbidity, if any, has not been of measurable clinical significance in this series.

RÉSUMÉ

Depuis 1947, à l'hôpital Saint-Joseph de Victoria, on a employé le thiopental 2 pour cent par voie rectale, à raison de 10 mg. par livre de poids pour compléter l'hypnose pré-anesthésique chez plus de 10,153 enfants. Nous avons constaté que cette méthode est sans danger, qu'elle est sûre et relativement facile à introduire dans le champ pédiatrique de l'anesthésie. Elle confère des avantages psychologiques tant pour le malade, l'anesthésiste, le personnel du département et de la salle d'opération que pour les parents. On ne rapporte aucun cas de mortalité, et la morbidité, s'il y en a eu, ne s'est pas avérée cliniquement appréciable.

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