A CLINICAL INVESTIGATION OF HALOTHANE ANAESTHESIA FOR DENTAL EXTRACTIONS IN CHILDREN

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General anaesthesia for extraction of teeth in the dental surgery has received considerable notice in the past few years. With the introduction of halothane (Raventos, 1956) as a new volatile anaesthetic, its use in dental surgery has become fairly extensive by both medical practitioners and dental surgeons for ambulatory patients requiring dental extractions.

Goldman (1959) designed a vapourizer for administration of halothane in conjunction with nitrous oxide and oxygen for use in dental surgery. With the increasing need for extraction of deciduous and even permanent teeth in children (Hargreaves, 1960) we decided to undertake a clinical investigation of the use of halothane anaesthesia for children requiring dental extractions.

Method of Investigation and Assessment

Children of all ages up to fifteen years, from Lancashire County School Clinics, were used in the investigation. Over 1,500 cases were treated during a two-year period commenced in 1960, and 211 unselected children were involved in the present investigation. Each child was weighed prior to anaesthesia and three industrial time clocks, attached to the anaesthetic apparatus, were used to measure length of induction, operation and recovery periods. The number of teeth extracted was also recorded. The anaesthetic machine used was a McKesson Simplor with a Goldman Mk 1 vapourizer

and Goldman nose-piece.

Induction time was defined as the length of time required to produce surgical anaesthesia. Operation time was defined as the period involving insertion of the gag, packing of the mouth and extraction of the teeth; and recovery time defined as the period from cessation of the administration of the anaesthetic to the time the patient could take an active part in his recovery.

Administration of Anaesthetic

Preparation

No child was accepted unless accompanied by a responsible adult and having had nothing to eat or drink for four hours prior to anaesthesia. Each child's medical history was checked from the clinic's medical records.

The child was met in the waiting room by a dental attendant who came with him into the surgery. He was seated in the dental chair which was adjusted to his size and then tipped backwards approximately 30°.

Induction

Induction was commenced with 100 per cent nitrous oxide at 7 or 8 mm. pressure with the nose-piece held near to the child's face. No gag or pack was inserted and the mouth remained closed. The child inhaled this for five or six breaths when oxygen was introduced at 10 per cent and halothane introduced with the vapourizer half-way open. The nose-piece was then placed over the child's nose for the next two or three breaths and the oxygen increased to 15 per cent then 20 per cent at approximately quarter minute intervals, according to the progress of the anaesthesia. If excitability occurred, the concentration of halothane was increased. When regular respiration was established, the operation was commenced.

Operation

The mouth was opened with a Doyen gag and packed to the fauces with gauze, and the airway checked. Halothane was continued in the mixture until the operation was about half completed. If restlessness occurred, halothane was re-introduced with the vapourizer half-way open.

Recovery

At the end of the operation the gag was removed but the packing

was left *in situ* unless it was very wet, in which case the mouth was repacked. The patient was brought upright until initial recovery took place, and then taken to a recovery room until ready to go home.

Results

The 211 children involved in the investigation were divided into three age groups, pre-school, junior and secondary school, and the average number of teeth extracted was compiled for each group (table I). The number of teeth extracted averaged between three and four per child. The duration of anaesthesia was timed for induction, operation, and recovery (table II). The induction and recovery periods were similar for each group with an average of one-and-a-half minutes and forty seconds respectively. No significant differences in respect of age and weight compared with duration of induction and recovery were shown. The standard deviation was less than eighteen seconds for the recovery period of each group.

TABLE I

THE AGE GROUPS OF CHILDREN WITH NUMBERS INVESTIGATED AND TEETH EXTRACTED

Age groups	1—5 *years*	6—11 *years*	12—15 *years*
Number of cases investigated ..	48	127	36
Average number of teeth extracted	3·4	4·0	3·1

TABLE II

THE DURATION OF ANAESTHESIA FOR EACH AGE GROUP

Age groups	1—5 *years*		6—11 *years*		12—15 *years*	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Time of induction	90 secs	22·1	96 secs	24·3	97 secs	17·2
Time of operation	88 secs	66·1	105 secs	46·2	108 secs	30·0
Time of recovery	41 secs	16·8	42 secs	17·1	39 secs	12·6

The length of the operation time depended mainly on the nature of the surgical procedure and the standard deviation was therefore greater.

Nausea and vomiting was recorded in seven of the cases, that is 3.3 per cent.

Discussion

The use of halothane anaesthesia for dental extractions was found to be suitable for all children in the present series, which included epileptic and cardiac patients.

The advantages of the anaesthetic compared with nitrous oxide and oxygen alone, or with the use of adjuvants such as trilene, were peaceful acceptance of the anaesthetic during induction of the child, high oxygenation at all times, good jaw relaxation and ability to prolong the operation, if necessary, in an unhurried manner. The recovery period was rapid, and post-operative nausea and vomiting was observed in only 3.3 per cent of cases. Bishop and Potts (1961) comparing several anaesthetic agents, suggested post-operative nausea and vomiting is twice as high in children, with most anaesthetic agents used. Sadove *et al.* (1960) in a study of 192 dental cases of all ages, also gave a low incidence of post-operative nausea and vomiting of 4.7 per cent. Wolfson (1962), comparing halothane with other anaesthetic agents used in dentistry, noted a similar rapid recovery period averaging 42 seconds in a series of 82 cases from all age groups.

In the present investigation, pre-school children were found to require a stronger concentration of halothane due to their relatively higher metabolic rate.

During a session of several cases, it was noted that a diminution of concentration of halothane appeared to occur due to cooling (Walsh 1958). If the vapourizer was slightly warmed between each case by holding the reservoir containing the halothane between the hands, this cooling was minimized.

Summary

The technique and results of a series of 211 unselected children from over 1,500 cases anaesthetized by the administration of halothane for dental extractions are given. The advantages of and lack of complications with this agent, are discussed.

Acknowledgements

We wish to thank the County Medical Officer of Health, Lancashire County

Council, for permission to complete this study.

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" If medical progress were to be measured solely in terms of published work, the number of journals in existence would be a source of satisfaction and pride. It must be remembered, however, that each journal provides work for a Council, and editorial staff and Board, several editors and sub-editors, numerous reviewers and writers, no doubt, of additional dialogue. The time spent in research is actually reduced by the man-hours devoted to academic journalism. And if all concerned were to read each other's journals (as would seem essential, to prevent duplication) they would clearly have time for nothing else. It is interesting to reflect, finally, that the few people who do research of any significance usually keep each other informed by private correspondence. This being so, we can scarcely avoid the conclusion that actual progress must vary inversely with the number of journals published. I know of one university library which receives some 33,000 journals each year and can scarcely find the staff to get them all entered and catalogued. That is to me, a sobering thought."

Professor Parkinson on Medical Journalism—*New Scientist*, 1962, No. 271, p. 194.