THE USE OF PROPAZINID FOR MINOR SURGERY

BY

MARGARET M. CLARK* AND MARK SWERDLOW

Department of Anaesthesia, Salford Group of Hospitals, Manchester, England

SUMMARY

Propanidid, an ultra-short-acting, non-barbiturate anaesthetic, was used in 200 patients undergoing a variety of minor surgical procedures and operations. The patients ranged in age from 6 to 85 years. The optimal dosage was 6 mg/kg in women, 7 mg/kg in men, and 7–8 mg/kg in children. The dosage must be greatly reduced in older patients. It was found that, used alone, propanidid provided adequate anaesthesia for the majority of the patients. In 33 cases a second dose of propanidid was required and in 10 patients supplementary nitrous oxide and oxygen had to be administered. The side effects encountered are detailed and the usefulness of the drug in this field is discussed.

Propanidid, a non-barbiturate intravenous anaesthetic has been used alone or together with nitrous oxide and oxygen to provide anaesthesia for dilatation and curettage (Dundee and Clarke, 1964), and for dental extractions (Goldman and Kennedy, 1964; Swerdlow, 1965). It has also been used alone or with various other anaesthetic agents for a variety of major and minor in-patient and out-patient operations (Howells et al., 1964).

Given intravenously in clinical doses propanidid produces a brief period of anaesthesia followed by rapid recovery of full consciousness and coordination. The authors consider that the most useful field for this new agent is in providing anaesthesia for brief out-patient procedures. It has therefore been employed as the sole anaesthetic for as wide a range as possible of brief surgical operations and manipulations. (Dental extractions are not included because these have already been reported in an earlier paper (Swerdlow, 1965).)

METHOD

The patients receive no premedication. Because of the brief duration of action of propanidid it is important that the operation field is prepared and towelled and the surgeon ready to commence before injection of the anaesthetic. An anaesthetic machine should be available so that oxygen and anaesthetic supplementation can be administered if necessary. The dose of anaesthetic depends on the patient's weight, age and the anticipated duration of the surgical procedure. In the present study the dosage has been varied in an attempt to find the smallest consistently effective dose for each operation. The dose (in mg/kg body weight) is accordingly injected intravenously taking about 20 seconds. Onset of anaesthesia is rapid and accompanied by marked hyperpnoea which signals the time for the surgeon to begin (about 25–30 seconds after starting injection). If the dose proves insufficient to provide adequate analgesia, or if the procedure is unduly protracted, anaesthesia can easily and satisfactorily be supplemented by nitrous oxide and oxygen. Alternatively anaesthesia can be prolonged by a further injection or injections of propanidid but in our view this method is unsatisfactory. Recovery of consciousness is rapid and generally peaceful although frequently accompanied by muscular fibrillations or twitches. The airway must be carefully supervised until reflexes and jaw tone return; the method is therefore not suitable for use by a single-handed surgeon. The patient is quickly fit to leave the theatre and presently to leave the hospital or clinic.

RESULTS

A total of 200 patients have been anaesthetized with propanidid alone for minor operations and procedures, usually on out-patients. Although most of the patients were fit a few were in poor general condition.
Table I shows the surgical procedures for which propanidid has been used as the sole anaesthetic. The ages of the patients ranged from 6 to 85 years. There were 113 males and 87 females; the average weight of the adult males was 70.8 kg and of the adult females 58.8 kg. There were 12 children.

Table II shows the range and averages of the duration of surgery in the various operation groups. The time between the termination of surgery and recovery of full consciousness (i.e., the patient awake and orientated) averaged 130.8 seconds and ranged from 5 seconds to 540 seconds. Once fully awake, the patient walked with support from the theatre and sat in the recovery room.

Patients were generally allowed to go home (with a companion) 10 to 15 minutes after recovery of consciousness.

General surgical.

Incision of abscesses often involves curettage and insertion of a drain. It follows that whereas the actual incision is very brief and a single small dose of propanidid suffices (19 cases) the more prolonged procedure frequently necessitates extension of anaesthesia. It was noted that patients having incision and drainage of abscesses frequently phonated during surgery. Brief sigmoidoscopy or proctoscopy (with perhaps excision of rectal polyp) and dilatation of sphincter ani can easily be performed—many of these are in older patients in whom a longer period of anaesthesia will result from any given dose. In the present series these were generally performed with the patient in the lateral position.

Ear, nose and throat.

Propanidid may be used for many minor E.N.T. procedures. It is important that the head be held steady throughout the procedure and that a nurse be available to restrain the patient should he start to move. The pharyngeal, laryngeal and swallowing reflexes return rapidly and before return of consciousness, so there should be no risk of inhalation of blood or foreign matter. It was noted that patients having cautery of the nasal septum almost invariably sneezed and/or coughed during surgery. One patient undergoing nasal cautery and one having aural toilet required a second dose of propanidid.

Reduction of fractured nasal bones is sometimes protracted because of the time taken for splinting the nose after reduction. Because of this, three patients in this series required a second dose of propanidid. (Supplementary nitrous oxide by face-piece is, of course, inapplicable in nose and throat surgery.) Bleeding during manipulation usually resulted in coughing. Removal of aural polyps and aural toilet may both be satisfactorily accomplished with a single dose of propanidid.
Orthopaedic.

A number of different orthopaedic manipulations were included in this series, namely manipulation of spine, hip, shoulder, knee and ankle. The brief period of muscular relaxation produced by a single dose of propanidid was adequate except in one patient who required supplementation.

It was found that fractures could be satisfactorily reduced under propanidid but the application of plaster of Paris frequently so lengthened the procedure that a second dose was necessary (4 cases).

The patients having a Steinman's pin inserted were elderly and a dose of 3-4 mg/kg was adequate for pinning and application of plaster.

Gynaecological.

The minor vaginal cases in this series included insertion of an intra-uterine pessary (1 case) and dilatation of vagina (2 cases).

Dosage.

It was found in general that the most satisfactory dose was 6 mg/kg in adult females and 7 mg/kg in men. In children a dose of 7-8 mg/kg was optimal; in older people (over 50 years) the dose was reduced to 4-5 mg/kg and in those over 70 a dose of 3-4 mg/kg was adequate. In addition to allowances for age and weight of the patient the dose also needs some adjustment for physical robustness.

In 33 cases a second or subsequent dose of propanidid was administered.

"Failed" cases.

In 10 patients propanidid proved completely inadequate to provide anaesthesia and supplementary nitrous oxide and oxygen had to be administered. In 9 other cases the dose of propanidid was relatively insufficient and considerable restraint had to be applied to the patient in order to complete the operation.

Side effects.

Muscular tremor was quite frequent during recovery from anaesthesia; it was especially common after incision of abscesses. In 1 patient facial twitching occurred and in 2 patients hiccoughs of more than momentary duration. Nausea occurred in 2 patients and vomiting in 3. While in general we have required the customary 4-5 hours pre-anaesthetic starvation there were 6 casualty cases in whom it seemed expedient to administer propanidid even though food and/or drink had been consumed within this time; in none of these patients did vomiting ensue. We have not found any untoward effects from the omission of premedication. Laryngeal spasm has not occurred in response to painful stimulation in any of the patients in this series. Thrombophlebitis was noted in 2 patients.

DISCUSSION

Anaesthesia for minor surgery presents the problem of producing brief and possibly deep anaesthesia while providing rapid recovery of reflexes, consciousness and ambulation. If an intravenous agent alone is to be used it must permit smooth extension of duration either by the administration of a larger initial dose or by repeated dosage.

In this paper the authors have tried to demonstrate the results that can be achieved when propanidid is used alone for anaesthesia. Intravenous injection of a clinical dose produces a brief period of unconsciousness, analgesia and transient relaxation. However, the duration of anaesthesia may on occasion be disconcertingly brief and there is sometimes an inconsistency of effect which has already been noted by Howells and co-workers (1964). It is important that the surgeon commences at the moment the patient loses consciousness and that he be expeditious in carrying out the procedure. While it is frequently quite reasonable to keep the patient awake during the preparation and towelling of the site of operation, in the nervous patient and when exposure might cause embarrassment it is kinder to anaesthetize the patient before the preliminaries to surgery; under such latter conditions propanidid loses its advantage.

Administration of a larger initial dose of propanidid than those used in this study will result in a longer period of analgesia but there will be some delay in recovery (Swerdlow, 1966, in preparation) and an increase in side effects. In the event of the operation outlasting the anaesthesia (either because of undue briefness of action or undue slowness on the part of the surgeon) anaesthesia can be easily and satisfactorily prolonged by the administration of nitrous oxide and oxygen, except, of course, in cases where the surgeon is...
operating on the face, as in ear, nose and throat procedures. Prolongation of effect by injection of second and subsequent doses has not in our hands proved very satisfactory. By the time it is realized that a second dose is necessary the patient is starting to move and by the time the second dose takes its effect the patient may well be unruly. Thus very uneven anaesthesia is produced by intermittent injections and in general supplementation with nitrous oxide and oxygen is recommended if prolongation of anaesthesia becomes necessary.

Propanidid is very viscous and requires a good deal of force to inject it unless a large needle (No. 1) is employed; this can to some extent be overcome by diluting with water, but the large volume may then be a disadvantage. The incidence of thrombophlebitis is certainly less than with a previous similar agent G.29.505 (Swerdlow, 1961) but seems to be greater than with other intravenous anaesthetics such as thiopentone or methohexitone. The fall in blood pressure (Dundee and Clarke, 1964; Howells et al., 1964) which follows injection of the anaesthetic has not caused upset in any of the patients in the present series. The low incidence of nausea and vomiting confirms observations made in an earlier series (Swerdlow, 1965) and agrees with the findings of Howells and associates (1965). Goldman and Kennedy (1964) and Dundee and Clarke (1964), however, found that vomiting was not uncommon after propanidid, but their patients received nitrous oxide in addition to the intravenous agent.

Podlesch and Zindler (1965) employed propanidid alone for 334 various minor surgical procedures. All but 79 of their patients were premedicated, and the dosage ranged from 5 to 12 mg/kg, so their results are not strictly comparable with those presented here.

Howells and associates (1964) used propanidid alone in a dose of 5–10 mg/kg in 50 unpremedicated patients. They found that although anaesthesia was satisfactory for orthopaedic manipulations and reduction of Colles fractures, incision of abscesses "provoked brisk protective reflexes". This difficulty was not encountered in the present authors' series. Howells and his colleagues also found that with a dose of more than 5 mg/kg there was "an unpredictable degree of post-hyperpnoeic respiratory depression". Such depression was not in evidence with the dose range used in the present study.

ACKNOWLEDGEMENTS

We are grateful to our surgical colleagues in the Salford Group of Hospitals for their co-operation. We must also thank Dr. Donald Whitfield of FBA Pharmaceuticals Ltd., for generous supplies of propanidid (Epontol), and Mrs. A. Adams for secretarial assistance.

REFERENCES


EMPLOI DU PROPANIDIDE EN PETITE CHIRURGIE

ZUSAMMENFASSUNG

Die Verwendung von Propanidid für kleinere chirurgische Eingriffe

ZUSAMMENFASSUNG

Bei 200 Patienten wurde für die Durchführung verschiedener kleinerer chirurgischer Eingriffe und Operationen das außerordentlich kurz wirkende, barbiturafreie Anästhetikum Propanidid verwendet. Die Patienten waren zwischen 6 und 85 Jahre alt. Die optimale Dosierung betrug bei der Frau 6 mg/kg, beim Mann 7 mg/kg und bei Kindern 7–8 mg/kg. Bei älteren Patienten mußte die Dosis erheblich reduziert werden. Es wurde festgestellt, daß Propanidid allein bei der Mehrzahl der Patienten eine ausreichende Narkose ermöglichte. Bei 33 Patienten wurde eine zweite Dosis Propanidid benötigt und bei 10 Patienten mußte zusätzlich Lachgas und Sauerstoff gegeben werden. Die beobachteten Nebenwirkungen wurden einzeln aufgeführt und die Brauchbarkeit des Narkosemittels für diese Zwecke besprochen.