A CLINICAL EVALUATION OF SURITAL SODIUM (THIAMYLAL SODIUM)*

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Surital Sodium (Parke Davies and Company) is the sodium salt of a thio-analogue of barbituric acid—sodium 5-allyl-5 (1-methylbututyl) -2-thiobarbiturate; or, more briefly, Surital Sodium is the thio-analogue of Seconal, just as Pentothal Sodium is the thio-analogue of Nembutal.[1]

We have submitted this drug to preliminary clinical trial. Although it has been used fairly extensively since 1950 in the United States and very recently in Great Britain,[2] this is the first time it has been used in South Africa. We have used it both intravenously and rectally, either alone or in combination with general and local anaesthesia, thiopentone being our standard of comparison.

INTRAVENOUS USE

Surital Sodium is supplied as a yellow powder for intravenous use in a 2½% solution. The solution is clear but may become cloudy on ageing and should then be discarded.

Patients are prepared in the same way as for any general anaesthetic, with suitable premedication. It may be combined with any other anaesthetic or relaxant. The rate of injection is similar to that employed with thiopentone, the initial dose being on an average 300-350 mg.

As with thiopentone, care should be employed when using it in poor-risk patients.

We have used Surital intravenously in 142 cases, either alone or in combination with other anaesthetic or relaxant drugs. The patients have been in all age-groups, and many have been poor anaesthetic risks and surgical emergencies. Some have been out-patients.

Like most workers[3,4] we have found it to be more potent than thiopentone, with a shorter duration of action. Wyngaarden *et al.*,[5] in dog experiments, found the ratio of potency between thiopentone and Surital

* A paper submitted at the South African Medical Congress, Pretoria, October 1955.

Sodium to be 1 : 1½. Like thiopentone, Surital is a hypnotic rather than an analgesic.

Helrich, Papper and Rovenstine[6] state that the state of hypnosis without surgical anaesthesia can be maintained easily and regularly with Surital Sodium. This is true even in prolonged procedures if nitrous oxide supplement is used.

Because of the short duration of action and rapid recovery of consciousness, Surital has a place in the treatment of out-patients, and is useful for short anaesthetics in the operating theatre.

Greater potency and rapid elimination make it imperative to watch the plane of anaesthesia very closely[7]

We have found the initial drop in blood pressure with Surital Sodium to be similar to that found with thiopentone.

Some workers[6–8] hold that when Surital Sodium is used there is less incidence of laryngeal spasm and respiratory depression than with thiopentone; this we have not found to be the case. As with thiopentone, great care must be exercised when using Surital Sodium in cases of respiratory obstruction.

Lorhan and Devine[9] found a greater degree of emesis and nausea with Surital. We have not noticed this; but our work has been done on Africans, among whom the incidence of nausea and vomiting following anaesthesia is low.

Comparison with intravenous thiopentone. It would appear that the main advantage of intravenous Surital Sodium over thiopentone is the shorter recovery period, together with the greater hypnotic action. This alone justifies its inclusion in the armamentarium of the anaesthetist.

RECTAL USE

Apart from Helrich *et al.*[8] we can find practically no literature on rectal Surital Sodium. For rectal use it is supplied as a green powder in vials of 1½ g., to be used as a 5 or 10% solution in physiological sodium chloride or distilled water. Tap water may be used in localities where it does not cause cloudiness. We use 5% solution, which may be kept for 24 hours. Although this is not confirmed by the manufacturers, we have found that Surital Sodium deteriorates when exposed to heat, becoming yellow and insoluble. Such solutions should be discarded.

As with rectal thiopentone, a saline enema several hours before the operation has been recommended. We have not found this to be necessary, provided the solution is instilled high up in the rectum. In a certain number of cases evacuation of the rectum occurs, whether the patient has had an enema or not. Even if it does occur, the patient still goes to sleep.

The patient should be prepared as for a general anaesthetic and the stomach should be empty. Atropine or hyoscine should be given as a premedication and in very nervous patients or those with a high metabolic rate it is advisable to administer Omnopon or Pethidine as well.

The recommended dosage of rectal Surital Sodium for pre-anaesthetic sedation is 1·33 g. per 100 lb. body-weight, which is the equivalent of 0·266 c.c. of a 5% solution per lb. body-weight. A dosage of 0·25 c.c. per lb. body-weight is more easily calculated, and we have found it to be effective.

The dosage for basal anaesthesia is 0·4 c.c. of a 5% solution per lb. of body-weight, which is 2 g. per 100 lb. body-weight.

Within 4-15 minutes after administration the patient falls into a normal sleep, from which he can easily be roused and should therefore be handled gently. This lasts a variable time, but recovery usually occurs in 15-45 minutes, or even up to an hour or more. The patient remains drowsy for some considerable time.

Because of its rapid action Surital is best given in the anaesthetic room. The quick recovery is an advantage in out-patients, but there is the disadvantage that the pre-operative instillation must be accurately timed; otherwise the patient may awake before the anaesthetic is commenced.

Contra-indications to the use of rectal Surital are those of any barbiturate. It should be used carefully in asthma and patients with diseases of the liver, trachea or throat. Rectal administration is contra-indicated in patients with disease of the rectum or loss of control of the anal spinchter.

We have administered Surital Sodium rectally in 137 cases, the youngest patient being 6 weeks and the oldest being 60 years. We have used it in the following ways:

1. *As a premedication* in patients who are to have general anaesthetics. Here it is especially useful in apprehensive patients and those who have to undergo repeated operations, more particularly children or adults who have poor veins or are needle-shy.

2. *As an adjunct to local anaesthesia*, e.g. in conjunction with topical anaesthesia in the needling of cataracts in children, and with nerve blocks or infiltration anaesthesia in circumcisions and gland biopsies. In children, operations can thus be performed under local anaesthesia which would normally require general anaesthesia. It should be stressed, however, that the local anaesthetic must be adequate.

3. *For the changing of dressings and plasters.* Surital has only slight analgesic effect, and therefore in painful cases Pethedine should be included in the premedication.

4. *For examinations* such as X-rays, opthalmological examinations and angiocardiography in children and subnormal or non-cooperative adults.

5. *Therapeutically* in cases suffering convulsions. We would quote a case of a child aged 13 months with convulsions due to the swallowing of camphorated oil. He was given the pre-medication rectal dose, and was asleep in 5 minutes. A stomach wash-out was then carried out and the patient was catheterized. Recovery from the Surital took place within an hour, and thereafter the patient was controlled with Luminal. Within 12 hours he had recovered completely.

Contrary to Helrich *et al.*,[8] we have found no particular advantage in basal anaesthesia, having achieved as much with the pre-medication dose as is achieved with the basal dose, without the respiratory depressant effect which is noted with the basal dose.

Comparison with rectal thiopentone. The advantage of Surital Sodium over thiopentone lies in the rapidity

of onset of sleep, together with the quick awakening. As the patient, though asleep, is easily roused and retains his reflexes, it is a true preanaesthetic sedation. With thiopentone we have found that the patient is sometimes too deeply asleep. However, good timing in relation to the operation is of greater importance with Surital than with thiopentone because of the rapid detoxioation. Although, like all rectal anaesthetics, the action of Surital Sodium is not one hundred per cent reliable, it would appear that it is effective in a higher percentage of cases than thiopentone.

SUMMARY

1. The use of Surital Sodium (thiamylal sodium) both rectally and intravenously is discussed.
2. Its rapid absorption and elimination is stressed.
3. A comparison is made between Surital Sodium and thiopentone.

We wish to thank Messrs. Parke Davis and Company, who supplied us with the drugs, and the members of the anaesthetic staffs of the Coronation and Baragwanath Hospitals, who assisted us in collecting the material for this paper.

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