

NISENTIL HYDROCHLORIDE ANALGESIA AND PENTOTHAL SODIUM AMNESIA IN DENTAL SURGERY

Preliminary Report

ELMARS M. BITTE, M.D., DONALD E. HALE, M.D.,
Department of Anesthesiology

and

JOHN K. DUNN, D.D.S.
Department of Dental Surgery

FEAR of even the simplest dental extraction under local anesthesia induces in many patients a state of anxiety which must be controlled to render them calm, relaxed, and co-operative for the surgical procedure. We recently initiated a clinical study of analgesia and amnesia for dental extractions in ambulatory patients in whom analgesia was produced by Nisentil hydrochloride (alphaprodine hydrochloride, Hoffmann-LaRoche) and amnesia by Pentothal sodium (thiopental sodium, Abbott). Nisentil hydrochloride has been used widely in obstetrics,¹ urologic examinations,^{2,3,4} endoscopic procedures,⁵ and oral surgery.^{4,6}

This preliminary report presents our experience with Nisentil hydrochloride and Pentothal sodium in 128 cases requiring dental surgery.

An ideal analgesic for dental extraction (1) permits rapid induction, (2) effectively relieves pain, (3) does not interfere with the patient's ability to co-operate during the procedure, (4) has a total action not significantly longer than the operating time, and (5) causes a minimum of side reactions. Nisentil hydrochloride appeared to have most of these characteristics and it was chosen for our clinical studies in dental surgical procedures.

Alphaprodine hydrochloride. The use of alphaprodine hydrochloride was first reported by Ziering and Lee, in 1947.⁷ Its chemical structure is similar to that of meperidine (Demerol hydrochloride) — a synthetic piperidine derivative — but not to that of morphine. In a comparative study of Nisentil hydrochloride and morphine, in which equally potent analgesic doses of the two agents were given to normal volunteers, Gross, Holland, and Schueler⁸ found that Nisentil hydrochloride had a more rapid onset of action, a shorter period of effectiveness, and fewer side reactions. Particularly notable was the relative infrequency of such side effects as nausea, vomiting, itching, and deep sedation.⁹ In our study, two patients vomited postoperatively and four others complained of nausea. Dizziness, and diaphoresis occurred with greater frequency. The rapid effect and relatively short period of action of the drug permit considerable flexibility in administration. After intravenous administration, maximum effects are

obtained within three minutes, and the effects subsequently disappear within 30 to 60 minutes.¹⁰ The sedative effect is very mild, and does not correspond to the depth of analgesia. Nisentil hydrochloride decreases the respiratory rate and tidal volume,¹¹ an effect that becomes pronounced when Pentothal sodium is used concomitantly. Therefore, to assure adequate alveolar ventilation, the patient is encouraged to take frequent deep breaths during the operative procedure.

Gruber, Lee, and Gruber¹² found that toxic doses of alphaprodine hydrochloride in rats, mice, and rabbits were evidenced by clonic convulsions and exophthalmos. Some animals died of respiratory failure.

Procedure

In the present study, 128 patients ranging in age from 8 to 71 years comprised the series. For each patient, routine history taking and physical examination preceded the operation. Premedication consisted of 50 to 100 mg. of Seconal sodium administered orally 45 to 60 minutes before operation. Upon his arrival to the dental chair, the patient's blood pressure, pulse, and respiratory rate were obtained and recorded. Five per cent dextrose in water was intravenously administered and with it was given 10 to 40 mg. of Nisentil hydrochloride. The dose is determined according to the patient's age, weight, and condition of general health. Dosage schedules for normal adults, excluding undernourished or obese patients, were calculated on the basis of 0.5 mg. per kg. of body weight. Average dosage for the normal adult female was 30 mg. and for the normal adult male 35 to 40 mg. Dosages for children may be determined by Young's

$$\text{rule}^{13}: \quad \text{Children's dose} = \frac{\text{Age times adult dose}}{\text{Age plus 12}}.$$

In the event of overdosage, Nalline hydrochloride¹⁰ or Levallorphan tartrate¹⁴ are effective antidotes. It is assumed, however, that provision for artificial respiration with oxygen by an anesthesia machine and endotracheal equipment under the supervision of a competent anesthetist are available. Three to five minutes after the Nisentil hydrochloride was given, 20 to 40 mg. (1 or 2 ml. of a 2 per cent solution) of Pentothal sodium was administered. Local anesthesia was used as a supplement in approximately 75 per cent of the cases. It should be emphasized, however, that the local anesthetic was infiltrated only into the gingival tissues, no attempt being made to achieve subperiosteal infiltration or nerve-conduction analgesia. Surgical procedures were then started and additional 20-mg. doses of Pentothal sodium were given as necessary. The patient remained conscious and awake, but drowsy, so he was able to respond to commands and to co-operate during the surgical procedure. Care was taken not to give an overdose of Pentothal sodium which would produce unconsciousness and lessen the safety of this technic. Apnea and unconsciousness occurred in six cases. These patients were in the older age group and were debilitated. Oxygen delivered by mask with positive-pressure breathing for approximately two minutes corrected this condition.

As mentioned before, close attention was paid to respiration, and the patient

was requested to breathe deeply. Upon completion of the procedure, the patient, still with his senses somewhat dulled, walked with assistance to the recovery room and was allowed to lie down. He reclined for 30 to 60 minutes, depending upon the extent of the procedure and the amounts of the anesthetic agents used and, when dismissed, he was placed in the charge of the person who had accompanied him to the Clinic.

Comment

The problems of anxiety and pain, and the need for anesthesia are related in dental surgery. Reassurance, sedation, intravenous anesthesia, and local block all contribute to the solution of these problems, and Nisentil hydrochloride seems to be a useful agent in producing these effects.

During the study of this method, it was observed that: (1) The patient is rendered analgesic but does not lose consciousness. (2) He remains co-operative, and follows instruction when asked to open his mouth or to turn his head from side to side. He breathes deeply upon request. (3) He retains his swallowing and coughing reflexes. (4) He seldom, if ever, experiences any pain where the needle is inserted and the anesthetic solution has infiltrated. (5) Amnesia for the surgical procedure is produced in approximately 80 per cent of the cases. A few patients cry out and manifest the facial grimacing ordinarily associated with reaction to pain but, later, after the operation has been completed, they will state that they have no memory of having pain. The release of emotional tension was observed in a few patients who simultaneously quietly cried and smiled when told that the operation had been completed. Failure to produce amnesia and analgesia was observed in 5 per cent of the cases. (6) The Pentothal sodium requirement with Nisentil hydrochloride is definitely reduced as compared with the amount required when Pentothal sodium is used by itself. In our series, the amount averaged about 100 mg. of Pentothal sodium per patient. On the basis of reports¹⁵ from other oral surgeons it is estimated that at least 200 mg. or more of Pentothal sodium alone is required for the average dental surgical case. (7) In the majority of cases there is no postoperative pain. Narcotic addiction seems unlikely as a result of the method reported, as the patient receives but a single injection of Nisentil hydrochloride.

Summary

A technic for establishing a modified analgesic state suitable for ambulatory patients who are to undergo dental surgery is being studied. Nisentil hydrochloride, a relatively new basal analgesic, has been used in combination with premedication and Pentothal sodium amnesia. Properly employed, it plays a valuable role in relieving anxiety and pain, and as a supplement to local block. In selected cases this technic may be used for more extensive dental surgery that otherwise would require hospitalization and endotracheal anesthesia. This technic causes little or no interference with the homeostatic mechanisms of the patient during and after operation.

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