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# Alphaprodine-dimenhydrinate sedation in pedodontics

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I have practiced in San Diego for eleven years and for the past five years have practiced with both a pedodontic and orthodontic associate. We have an eleven-chair office, two of which are located in separate rooms and set up for use in sedation cases.

My primary use of the alphaprodine-dimenhydrinate (Dramamine®) sedation technique is as a substitute for taking the young, nonmedically compromised, child patient to the hospital. I average four to five sedation cases per month and my associate averages eight to nine sedation cases. I utilize this sedation technique primarily for the young nursing caries case. It is also helpful in treating cases of oral-dental trauma in the very young child.

My treamtent of nursing caries cases are comprehensive. I make every effort to save the anterior teeth and opt to perform pulpectomies and plastic crowns instead of extractions, unless the case definitely dictates extraction. The child is typically between 18 and 30 months old. I have found that the use of alphaprodine-dimenhydrinate is an excellent way of treating these children without resorting to hospitalization for their care.

I have used alphaprodine for around eight years and the combination of alphaprodine and dimenhydrinate for about five years. Over that period of time, we have utilized alphaprodine for approximately 500 cases. This is not a large sample, but I feel it is an adequate sample as far as clinical experience is concerned.

The restorative treatment in the very young or the unmanageable preschool child is a common problem for the pedodontist. Several drugs have been used for years in pedodontics with varying degrees of success. For me, the use of an alphaprodine-dimenhydrinate combination in conjunction with nitrous oxide/oxygen has been a highly successful technique in the management of very young, nonmedically compromised patients where hospitalization and general anesthesia may have been considered as the alternative method of patient management control.

A perplexing problem that faces the pedodontist is the operative managment of the young preschool aged dental patient. Many children approach the dental experience with a normal but controlled amount of anxiety. Some children, for various reasons, are not able to cope with the dental situation. Patients in that category, be it due to physical, emotional or mental handicaps, or because of young age, offer a challenge to the practitioner who desires to treat the child in the office. The nonpharmacotherapeutic approach to behavior management is the most desirous form. With the potentially cooperative child this approach may start with the psychological approach; techniques of tell-show-do, modeling, reinforcement, or association. Many children will respond to these approaches and will not require special measures of control.

In some instances, the behavior management of the child patient will not be controlled by psychological methods and must be supplemented with the pharmacotherapeutic approach. Sedation should be viewed as an aid in helping the child cope with the dental situation by reducing anxieties and raising the pain threshold.

The sedation technique may start with the use of nitrous oxide/oxygen relative analgesia. Along with this inhalation approach, one may also incorporate the use of oral, parenteral, rectal, or combinations of the above drugs. Should the sedative and psychological techniques prove to be inadequate in the behavior management of the child, the practitioner must weigh the decision to use general anesthesia or accept compromised treatment.

Inhalation analgesia has afforded the pedodontist a modality to help control many apprehensive and anxious dental patients. Its advantages are that it allows for accurate titration of effect, atraumatic administration, rapid induction and recovery, and a minimum of contraindications. Its disadvantages are the increased incidence of nausea, refusal of the mask, and mouth breathing with the result of inef-

fective sedation.

The pedodontist must be cognizant of the limits of nitrous oxide/oxygen analgesia and its inability to control all forms of behavior problems, especially of the defiant or hysterical variety. The philosophical approach toward pharmacology for each pedodontist should be to limit the number of drugs used: in this way the characteristics of those drugs which are used can be predictably known and the chances of successful sedation increased.

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Oral sedative drugs have been used for years in pedodontics with varying degrees of success. It is a very popular method of administration due to the relative ease of administration and the potential calming effects to the child before arrival in the office. Relative analgesia can be a successful adjunct to this approach. The disadvantages of oral premedication are the undependable absorption factors, possible poor parental cooperation, and paradoxical excitement reactions in some children.

Occasionally a child's behavior can not be controlled by the use of oral and inhalation routes of administration and the pedodontist may choose to supplement them with parenteral drugs. The parenteral route may be utilized with one or both of the oral and inhalation methods and offers the practitioner a more dependable effect due to the greater certainty of absorption of an accurate known quantity. The method of administration can be subcutaneous, submucosal, or intravenous. The intravenous route is not often indicated in the very uncooperative child in the office because the probability of side effects is increased (the severity and speed with which they occur are also factors to consider).

The object of this paper is to introduce the use of the parenteral administration of alphaprodine-dimenhydrinate in combination with nitrous oxide/oxygen as a reliable technique for controlling the unmanageable young pedodontic patient. It is utilized as a technique to manage the young, nonmedically compromised patient where hospitalization and general anesthesia may have been considered as an alternative method of patient management control.

I started utilizing alphaprodine approximately eight years ago as an adjunct to nitrous/oxygen analgesia when I realized the limitations of the use of inhalation analgesia in the young child patient. The problems of continued mouth breathing and the inability to gain adequate sedation with the excited young patient led me to supplement the relative analgesia method. The advantage of the parenterally administered drug appealed to me after disappointing success with oral premedications.

The use of alphaprodine was considered because it is a rapid acting narcotic of short duration. The primary advantage of alphaprodine is its fast onset of action. When administered submucosally its onset of action is usually apparent within five to ten minutes. It is rapidly metabolized by the liver with little unchanged drug being excreted in the urine. Respiratory depression is the most undesirable side effects and can be life threatening. A narcotic antagonist such as the naloxone must be available with a syringe for immediate use if signs of respiratory depression are observed.

In addition to the potential for respiratory depression, the most common undesirable side effect is nausea and vomiting. The reaction tends to occur more often at the end of the treatment procedure and usually not until the patient is in the upright position. This undesirable side effect of narcotics has led many practitioners to use promethazine as a comedicant to counteract the emetic potential of the narcotic.

The possible potentiating effect of promethazine when utilized with a narcotic like alphaprodine became a concern of mine. I found dimenhydrinate to be compatable with alphaprodine, and to have a low potentiating effect on the narcotic. A dosage level of 0.725 mg/kg (0.33 mg/lb) of dimenhydrinate injected submucosally was found to successfully control the narcotic-induced nausea. This technique is utilized mainly on the unmanageable child between 15 months and 5 years of age.

The child's medical history should be evaluated: this technique should be used with extreme caution in patients with hepatic insufficiency, severe CNS depression, convulsive disorders, and allergic or any other systemic conditions affecting respiratory function on airway maintenance.

Hospitalization with general anesthesia should be considered if the child is unmanageable with other methods and/or if the medical history indicates that the child may be compromised if the narcotic is utilized.

When a child is considered for the alphaprodine-dimenhydrinate regimen, parents are given instructions to have the child NPO for four to six hours before the administration of the drugs. It has been found that postoperative nausea and vomiting can be successfully controlled with the use of dimenhydrinate and by having the child NPO. Postoperative nausea and vomiting has been ob-

served only if the parents have violated the NPO rule.

The dosage of alphaprodine found to be successful in managing the child patient who qualified for this technique was in the range of 0.66-1.1 mg/kg (.3 to .5 milligrams per pound). The average dose that I have utilized is around .88 mg/kg (.4 milligrams per pound). This dose varies with the child's observed behavior and temperament during the initial examination appointment and at the start of the operative appointment. The dose is calibrated after the child has been weighed, and the medication is administered with a 26 gauge 3/8 inch needle and a tuberculin syringe.

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When the child is brought into the operatory, he is placed on a papoose board without restraints. The child's behavior is then observed during the induction of nitrous oxide/oxygen. The patient is started on 40-50% nitrous oxide, depending on the behavior exhibited. The usual level being around 45%. Restraints are applied for the administration of the drugs and for use during the operative procedure if it is deemed necessary because of negative behavior.

If the nitrous oxide/oxygen alone is unsuccessful in controlling the patient, the drugs are drawn and injected into the submucosal tissue in the maxillary tuberosity region. The practitioner must aspirate before any submucosal injection to reduce the possibility of intravascular injections.

There were times when I have injected the drugs in the retromolar area where we would give a mandibular block injection, but I found that because of the anesthetic effect of the alphaprodine, I had some children that would chew their lip and or tongue; therefore, I have tried to avoid that location for injection.

After signs of sedation are observed, the local anesthetic Citanest Forte is given, because of its short duration and the increased depth of anesthesia achieved. Local anesthesia may be limited to the anterior teeth and the amount kept to a minimum. The usual amount is approximately half of a 1.8 cc carpule, and more than one carpule has not been required in any of my cases.

Although Dr. Aubuchon has mentioned the increased possibility of convulsive reactions with the use of Citanest, I feel that I use a very low dose and therefore am not at a level of danger.

After operative local anesthesia is achieved and the child is in an acceptably sedated state, the restorative treatment can be initiated and the nitrous oxide/oxygen level reduced to somewhere around 35-40%. Most of my cases last about an hour, but an hour and a half is possible.

The child's respiration is monitored with an inhalation anesthesia machine that I utilize. I have what is called a Bird Corporation Blender®. It has a demand feature which has an audible sound. The introduction of gases into the bag causes this audible sound. It is a definite hissing noise. As the gases come in, the valve opens and closes so you can hear the respiration of the child as you are continuing with treatment. In addition, the child is constantly observed visually during the procedure. The rubber dam is utilized whenever necessary.

At the end of the procedure, 100% oxygen is administered for at least five minutes to fully oxygenate the child.

Although it is rare that I have to schedule a second appointment to complete treatment, I'm not uncomfortable with that if it is necessary. I break it up into one arch at one appointment and another arch the next appointment.

I have emergency equipment available if it is required. The assistant and/or a doctor is always with the patient. I have to report that there has been only one child in the eight years that I have been using alphaprodine that experienced any respiratory depression or cyanosis, and this child was treated immediately with naloxone and reversed successfully with 0.2 milligrams. I had this reaction with promethazine and I have to agree with some of the information that Dr. Creedon has related to you concerning his experiences with promethazine and alphaprodine. Therefore, I do not recommend the combination of those two drugs. That was only one experience but such experiences tend to be very vivid.

I view the efficacy of this combination of alphprodine and dimenhydrimate as very good. I would say that my success in sedating children is in the 90% plus range. I am very comfortable with the use of these drugs, and am very happy with what I am able to do with them. I would find it very difficult to continue the type of office-based care that I desire to provide for children without them.

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