AUDIOVISUAL IATROSEDATION WITH VIDEO EYEGLASSES DISTRACTION METHOD IN PEDIATRIC DENTISTRY: CASE HISTORY

Magora Florella¹*, Cohen Sarale¹, Ram Diana Ram²

¹. MD Dept. Anesthesiology & Critical Care Hadassah Medical Center Jerusalem, Israel
². PhD Dept. Anesthesiology & Critical Care Hadassah Medical Center Jerusalem, Israel
³. DMD Dept. of Pediatric Dentistry Hadassah School of Dental Medicine Jerusalem, Israel.

Abstract

Audiovisual wireless eyeglasses method of distraction (AVD) is able to replace the visual and auditory signals from the environment by a pleasant movie. This method offers the possibility of non-pharmacological sedation in patients undergoing dental treatment.

The effect of AVD in four children is reported. The children wore the AVD eyeglasses before the local anesthetic injection and throughout the whole dental procedure. All four children were rated as uncooperative (Frankl 1) before the treatment. During treatment with Audiovisual distraction (AVD) ratings on the Houpt behavior scale showed that the children were very good or excellent (Houpt 5-6) during all the dental sessions. Satisfaction VAS ratings 0-10 given separately by the children, parents and dentists were between 8-10.

AVD is an additional non pharmacologic, easy to use behavior management technique for pediatric dentistry. It may be of benefit especially to uncooperative, very anxious children and prevent pharmacologic means of sedation by offering a pleasurable method without adverse effects.


Keywords: Audiovisual glasses, iatrosedation, pediatric dentistry.

Introduction

The question of how to sedate effectively during pediatric dental procedures is of paramount importance to clinicians and families.

The need for methods to avoid sedation sessions with general analgesic agents is widely acknowledged. Non pharmacological adjunct behavioral management methods of treatment such as parental presence and reassurance, tranquilizing verbal approaches, physical contact by light touching or stroking and music, are commonly used tactics to diminish anxiety and reinforce children’s cooperative behavior in the pediatric dental practice¹-⁶.

Though sometimes helpful, these methods have been of limited effectiveness especially for highly anxious children.

Audiovisual distraction (AVD) is a promising technique that offers an additional non pharmacological mode of sedation conceived to diminish the unpleasantness often associated with dental procedures in children⁷,⁸ and adults⁹-¹¹.

It is a powerful distraction tool because it takes control in an enjoyable way over two types of sensations, hearing and visual. At the same time it succeeds in partially isolating the patient from the sounds and the sight of the unfriendly medical environment. The recognition of the distraction potential from audiovisual techniques has led many dentists to install television screens in the dental operatory. The development of wireless audiovisual eyeglasses that are easy to use, inexpensive, and comfortable for the dentist and the child has opened further opportunities for usage in dental treatment. A controlled research study with children compared ADV using wireless glasses with nitrous oxide and the results...
confirmed the efficacy of the AVD methodology\textsuperscript{8}.

The case reports presented will exemplify cases in which this technique has been used successfully and may encourage other practitioners to try this technique particularly for anxious children.

**Case Reports**

Four illustrative cases are described to exemplify the merit of the AVD eyeglasses on children's behavior during dental treatment. All four children were referred to the University Hospital Pediatric Dental Clinic by their outside treating dentists because of a combination of poor cooperation and the necessity for complex procedures that required sedation. The parents agreed to AVD sedation for their child and signed a consent form approved by the Hospital Ethical Committee.

At the initial visit a pediatric dentist examined each one of the children and classified their status on the anxiety/cooperative Frankl rating score as Frankl 1 because of disruptive behavior manifested by strong fear, refusal of treatment and other evidence of extreme negativism \textsuperscript{12}. On treatment day, before beginning the invasive procedure, the child was asked to choose a movie from a selection of known popular children's movies (e.g. Mickey Mouse, Pinocchio, Toy Story, Madagascar). The child and the parent were told that they should feel free to interrupt viewing anytime, and withdrawal will have no effect on the dental care the child will receive. Then the audiovisual video, wireless eyeglasses with earphones (Mobile Theatre MT320, Prober Industries) were demonstrated, and the glasses were secured in place. See Figure 1. During the whole dental procedure pulse, respiration and oxygen saturation were monitored every few minutes and the child's behavior, limb and body movements and crying were observed and a summed score was obtained according to the Houpt scale 1-6 representing: aborted, poor, fair, good, very good, excellent \textsuperscript{13}. Every treatment lasted more than 30 minutes and included technically complex procedures such as direct restoration, crowns, and root canals. At the end of treatment a satisfaction score was obtained from the child, his parent and the dental clinician on a VAS scale 0-10: not at all satisfied to completely satisfied with the AVD treatment.

**Case 1:** A 10 year- old- boy with cleft lip repaired when he was 5 months old was referred to the pediatric dental clinic. The child was cooperative over the years during multiple dental evaluation and treatments. When he was 10 years he had to undergo a new series of complex prolonged difficult sessions before he was considered ready for bone graft implant. At that point, he became uncooperative and the treatment had to be continued under oral conscious sedation. He received oral sedation with diazepam 0.3 /1 kg syrup1 mg./1cc. The child vomited repeatedly during the treatment, suffered from severe headache following the procedure and was left with memories of a very unpleasant experience in the dental chair. Both the child and the parents were reluctant to continue the dental restoration procedures under this type of sedation. For the subsequent 3 visits dental procedures included pulpotomies, stainless steel crowns, amalgam filling, composite fillings and fissure sealants using AVD together with local anesthesia yielding excellent results.

**Case 2:** A 6 year-old-girl received restorative dental interventions under nitrous oxide. However, she cried and complained during these sessions and rejected further nitrous oxide treatment . AVD method was suggested by the dentist for continuation of the dental work required. The girl was offered the option of viewing a movie through the AVD glasses during the treatment. The mother told us that the girl is a fan of the SpongeBob show on TV. The girl was then treated with AVD eyeglasses using the SpongeBob movie. As she watched the movie, she sat willingly on the dental chair and cooperated without crying or interfering in any
way with the procedures. The dental procedures performed were: amalgam fillings, composite fillings and stainless steel crowns. Furthermore, the child refused to be treated without the glasses in the future sessions.

**Case 3:** A highly anxious 5 year-old-boy was referred to the University Dental Pediatric Clinic due to extremely uncooperative behavior. He had a very bad dental experience with nitrous oxide sedation. A thorough clinical examination revealed that the child could not breathe through the nose due to enlarged adenoids and therefore was unable to take advantage from previous sedation with the nitrous oxide mask. The dental work was completed successfully with AVD during three consecutive sessions where stainless steel crowns, dental extractions and space maintainer were performed.

**Case 4:** A 9 year-old Sudanese boy arrived at the clinic lacking a common language with the medical staff. The child, unable to communicate, sat in the dental chair but then was unnaturally quiet as if paralyzed by the unfamiliar surroundings and terrified by all those trying in vain to alleviate his fear. He refused to open his mouth. A translator was sent for to comfort and to communicate commands but was not immediately available. AVD was considered as a way to help until the translator appeared. Viewing a Mickey Mouse cartoon through the wireless eyeglasses caused the child to relax and the amalgam filling procedure was completed with no need for further assistance.

**Results**

During repeated dental treatments with AVD sedation, Houpt scores in all four children, were either values of 5 or 6 which translates as very good or excellent overall behavior. The local anesthetic was always preceded by topical analgesic (lignocaine 2%). Brief movements of the limbs occurred in the 5 year old boy (case 3) and the Sudanese boy (case 4) during the injection. In all four children no signs of distress were observed during any of the dental procedures as all four children were engrossed in the movie. At the conclusion of each treatment in all four cases VAS general satisfaction ratings obtained separately from the child, the parent, and the dentist were between 8-10 (very satisfied to completely satisfied). These results were similar when additional AVD dental treatment sessions were performed with these cases. There were no adverse effects observed with the use of AVD.

**Discussion**

The cases in this report, during repeated dental treatment using audiovisual eyeglass sedation showed positive changes in the behavior from the reactions prior to the use of the ADV. No changes in physiological parameters measured or any adverse effects were observed during the procedures. This method allowed completion of complex dental treatments in children such as who had unpleasant experiences with oral and nitrous oxide sedation. It is known that fixation on memories of a disturbing nature, leads to uncooperative behavior of the child during subsequent visits, by a decrease in pain threshold and tolerance and an enhanced level of anxiety. The application of AVD sedation techniques in the four children achieved not only avoidance of discomfort and improvement of children positive behavior during treatment, but also prevented the adverse effects of distressing memories and anticipatory anxiety and fear as shown by eagerness to participate in AVD at the repeated visits.

Dental care demands repeated multiple visits for adequate preventive and restorative treatment. However, beneficial effects of dental care are, at best, limited in uncooperative children afflicted by severe anticipatory anxiety and distress. For this reason dental care is often avoided or delayed resulting in unnecessary complications and poor oral health status. In a controlled study with children, audiovisual distraction using a regular television screen has been shown to supply sedative effects to children without adverse effects and/or interference with vital processes such as consciousness, sympathetic reflexes, or the arterial oxygen saturation. Similar results were found for the four cases presented here as well as in a study comparing AVD with nitrous oxide sedation.

Some dentists in pediatric private practice are using TV screens and earphones. Nevertheless, the video eyeglasses technique has the advantage to detach the child from the medical environment by cutting off most of the sounds and sight of the dental instruments (e.g. syringe, clamp, rubber dam, drill) and transfer him into a movie world of the child’s choice.
development in technology the video eyeglasses have become lighter, wireless, more user friendly and at an affordable price.

Conclusions

In conclusion the AVD method may contribute an additional good quality mode of sedation able to diminish the unpleasantness for every child undergoing dental interventions. AVD iatrosedation is particularly indicated to avoid pharmacologic means of sedation in highly anxious children.

Declaration of Interest

The authors report no conflict of interest and the article is not funded or supported by any research grant.

References