



Guest Editorial

Nitrous oxide inhalation sedation: Is it just a child's play?

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Nitrous oxide as an inhalational sedation agent has a long and interesting history. After its discovery in 1772 by Joseph Priestley who is also known for the discovery of oxygen, its first use as an anaesthetic for dentistry was made in 1844 by Horace Wells, a dentist in Hartford Connecticut, who got his tooth extracted under the analgesic effect of nitrous oxide. Practice of Nitrous oxide inhalation sedation is the most commonly used method for patient relaxation in dental offices today.

Nitrous oxide, popularly known as also “laughing gas” is being used now for over 175 years to provide more comfortable and painless dental treatments to the patients. Nitrous oxide sedation is the lightest form of dental sedation, but it can provide adequate level of anaesthesia and relaxation for most people and for the majority of dental procedures. It involves breathing a mixture of nitrous oxide gas in combination with oxygen which can help anxious patients to become more relaxed and co-operative during treatment without experiencing pain.

Inhalation analgesia, as it is also called, is a method of conscious sedation because the patient remains awake and conscious throughout the procedure. Nitrous oxide provides minimal sedation which is defined as a drug induced controlled state of minimally depressed consciousness. The patients retain the ability to breath without external aid, maintain their protective reflexes and the ability to respond normally to physical stimulation and to verbal commands.

It has gained much popularity amongst dentists to treat children who are uncooperative or afraid of the dentist and those with special health care needs having functional and cognitive deficits. The use among paediatric dentists has become such a common practice that we have started relating nitrous oxide inhalation sedation as a method to control anxiety and phobias in children. There is evidence to suggest that in children the beneficial effects of treatment with nitrous oxide sedation may last beyond one treatment session.^{1,2}

While we cater to the fear and dental anxiety of the children, we often neglect the anxiety, fear and sometimes phobias (often known as odontophobia or dentophobia) in adults. Anxiety and fear are two of the biggest reasons why most people tend to avoid visiting the dentist, even for a simple cleaning. Despite how irrational their worries might seem, these twinges of trepidation are very much legitimate for the person suffering through them. These fears / phobias usually are associated with either a past negative dental experience usually in childhood, or due to concerns pertaining to oral health. Locker et al reported that amongst 580 individuals between age group 50-89 years, the dental anxiety scores were higher in the edentulous population than the dentate. Older adults who were dentally anxious were less likely to report a regular source of dental care and a dental visit in the previous year and more likely to report having avoided or delayed dental treatment.³

Ironically, what we consider and has been established as a safe treatment modality to bring about behaviour

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modification in children, we somehow fail to utilize it as a routine measure to quell anxiety, fear and dental phobias in adults! On thinking rationally, we just can't find a concrete reason as to why for this group of anxious population suffering from what has been designated as "dentophobia" we leave the patient to depend upon utilising coping mechanism in all fearful situations where in most cases we face non-compliance to the dental visits, deferring of dental visits and ultimate dental neglect.

Nitrous oxide sedation is particularly advantageous compared with general anaesthesia for medically compromised patients. Patients with cardiovascular disease and cerebrovascular disease, especially those at risk from ischaemic episodes, benefit from the increased concentrations of oxygen administered routinely as part of the technique. Patients with bleeding disorders, sickle-cell trait, sickle-cell disease, epilepsy, liver and kidney disorders, diabetes and bronchial asthma can all benefit from the technique. Nitrous oxide does not enter into chemical processes on administration and therefore does not give rise to excretion products. It is less irritant to bronchial mucosa than other anaesthetic agents and patients are not required to fast before administration.

A few relative contraindications do accompany and should be taken care of that include the common cold or tonsillar/ adenoidal enlargement as the delivery of the gas requires a patent nasal airway; chronic obstructive pulmonary disease; pregnancy; severe asthma; psychiatric disease; complex cardiac conditions. In pregnancy, especially in the first trimester, administration of any drug is discouraged: however, where treatment is unavoidable and the patient is anxious then nitrous oxide sedation is the sedation agent of choice, because it is safer than intravenous sedation and preferable to general anaesthesia or no treatment at all.⁴

All the nitrous oxide does is numb the senses to create a more peaceful disposition. We as dentists however need to acknowledge the fact nitrous oxide alone is not as effective at numbing pain as other sedatives or anesthesia. Therefore, good candidates for laughing gas are usually those who will not be having complex oral surgery or similarly painful procedures.

Some of the best candidates for nitrous oxide are those looking to rid themselves of dental anxiety, thus allowing them to undergo treatment more easily. Inhalation sedation

is probably most successful when used for patients with a mild to moderate anxiety about dental procedures.⁴

Although patients may be more relaxed, they are still conscious and aware of their surroundings, allowing them to communicate with their dentist. It has a quick onset and a quick recovery. Evidence suggests that inhalation sedation can well be utilized to control hyperactive gag reflex, during administration of local anesthesia and once the machine is turned off, it takes about five minutes for the gas to leave the system, and the patient becomes completely lucid again.

Nitrous oxide sedation has been shown significantly to reduce anxiety at follow-up visits, even when treatment at those visits did not involve the use of sedation.^{1,5} This evidence confirms that nitrous oxide sedation can be used to build a patient's confidence and promote a positive attitude to dental treatment; this may in time allow the patient to accept treatment without the need for sedation. The time is apt to extend our horizons and make nitrous oxide inhalation sedation a mandate for our clinical practices, utilizing it to achieve better patient experience and regularity of recall visits without any hitch!

Conflict of Interest

None.

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