

Anesthesia with Respiratory Therapist, Nursing and Radiology Team Participation in Dental Practice: Review

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Abstract

The use of general anesthesia can make it easier for dental professionals to treat patients who, in the absence of this therapy, would be unable to obtain dental care themselves. Furthermore, the radiology team and the respiratory therapist, in conjunction with the nursing staff, will work together to ensure that the dental operation is carried out in a comfortable and risk-free manner. According to the opinions and preferences of dental practitioners, the type of local anesthetic that was most generally desired was lidocaine. On the other hand, the type of topical anesthetic that was most preferred was benzocaine in gel form. Furthermore, among Saudi dentists, the precise body weight was the factor that was utilized the most frequently in the process of determining the dosage of local anesthesia.

Keywords: *Dental practice, anesthesia, nursing.*

Introduction

Dental services from all around the world are currently working in a clinical, social, and political environment that is constantly shifting [1]. There is a possibility that the prevalence of some dental disorders, such as periodontal disease and dental caries, among people is decreasing [1]. On the other hand, an increasing

number of patients are experiencing multiple co-morbidities and complex oral health demands [2]. This is a phenomenon that is occurring among the elderly population, which is keeping its natural teeth for extended periods of time. Furthermore, it is widely acknowledged that there are geographical disparities in oral health and availability to dental treatment for patients all across the

world for patients. This national setting lends support to the argument that the dental workforce should be reformed, with a greater emphasis placed on the utilization of integrated multi-disciplinary teams that are tailor-made to meet the specific requirements of the community [3].

The practice of dentistry includes dental radiology, which is an essential component. All of the evaluations that take place before dental treatment, the judgment that takes place during treatment, the determination of post-treatment outcomes, and the subsequent follow-up assessments are required to rely on dental radiology [4]. This is in addition to the diagnosis of disorders that affect oral and dental hard tissues.

Dentists use general anesthesia, which is a sort of sophisticated behavior control, in order to deliver quality dental care to children who would otherwise be unable to undergo dental procedures in an outpatient setting. It has been shown that there is a lack of consensus in the study about the use of local anesthetic in conjunction with general anesthesia. The use of local anesthesia during dental rehabilitation procedures has the potential to offer a number of advantages, including a reduction in postoperative discomfort, an improvement in the control of hemorrhage, and a reduction in the requirement for anesthesiologist intervention. In terms of postoperative pain, Noble et al. discovered in a randomized controlled trial that patients who underwent extractions under general anesthesia and did not get systemic analgesics were less likely to be distressed upon recovery if local anesthetic infiltration was also applied. This was the case even though the patients were not given any systemic analgesics. A study indicated that individuals who got additional local anesthetic experienced a considerable reduction in the amount of pain they experienced at the location of the procedure. This difference was only significant after five minutes, according to the findings of a randomized controlled trial [5,6]. The study demonstrated that the addition of local anesthetic resulted in a statistically significant reduction in the amount of pain experienced after extractions.

If you want to improve the physiological characteristics that occur during general anesthesia, it has been suggested that you

employ local anesthesia in conjunction with general anesthesia. Patients who were getting dental treatment with additional local anesthetic had a constant heart rate and end-tidal carbon dioxide levels, according to the findings of another study. This was in contrast to children who were under general anesthesia but did not receive local anesthesia. Furthermore, patients who were given local anesthetic required less frequent involvement from the anesthesiologist for their treatment. Those who received local anesthetic had a statistically significant decreased change in heart rate and end-tidal carbon dioxide levels compared to those who did not receive it. Even though these physiologic changes are statistically significant, the brief rise in heart rate and breathing rate that occurs after crown insertion or extraction may not be clinically important in the treatment of a child who is in good condition [7].

Review:

The provision of care relies heavily on the importance of teamwork, which is why healthcare companies place a strong emphasis on it. When it comes to the quality and safety of treatment, a significant point of vulnerability that is frequently noted is a severe lack of collaboration. Consequently, the enhancement of teamwork has been given the highest emphasis. Because a wide variety of studies have demonstrated a positive effect of team interventions on performance outcomes (such as effectiveness, patient safety, and efficiency) within a variety of healthcare settings (such as operating theaters, intensive care units, or nursing homes), there is a strong belief that the effectiveness of healthcare teams can be improved through the implementation of team interventions [8].

The evaluation of multiple treatments was carried out by a large number of researchers and practitioners in light of the potential impact that team interventions have on the performance of teams and the delivery of care. The year 2008 marked the beginning of a systematic study that we carried out with the intention of presenting an overview of treatments that were designed to improve the efficacy of teams [8]. According to the findings of this review, there is a wide range of team interventions in terms of the type of intervention (such as simulation training, crew

resource management (CRM) training, interprofessional training, general team training, practical tools, and organizational interventions), the type of teams (such as multi-, mono-, and interdisciplinary teams), the type of healthcare setting (such as hospitals, elderly care, mental health, and primary care), and the quality of evidence [8]. From 2008 onward, there was a significant evolution in the body of knowledge concerning team interventions. This is clear from the number of literature studies that focused on particular types of interventions. There is a great potential for enhancing patient outcomes and patient health, as demonstrated by a meta-analysis that was published in a study [9] that demonstrated that team training is connected with teamwork and organizational performance. The results of a systematic review that was published in 2016 by another [10] demonstrated that simulation-based team training is an efficient way for teaching a certain kind of team (i.e., resuscitation teams) in the management of crisis scenarios and has the potential to increase team performance. The findings of a meta-analysis conducted by O'Dea et al. [11] in 2014 demonstrated that customer relationship management (CRM) training, which is a form of team intervention, has a significant impact on both knowledge and behavior in acute care settings, which are a specific type of healthcare setting. It is possible to list a dozen additional literature reviews that concentrate on the relationship between (a certain kind of) team interventions and team performance [12]. These reviews are in addition to the reviews that have already been cited. In conclusion, the vast body of empirical research demonstrates that the performance of a team can be enhanced through the implementation of a variety of team interventions.

However, each of the literature reviews that were discussed earlier had a limited scope, and they only partially answered the much more general topic of how to improve the efficacy of teams inside healthcare organizations. While some of these reviews concentrate on a particular team intervention, others are more concerned with a particular aspect of health care treatment. Tan et al. [13] provided an overview on team simulation in the operating theater, and O'Dea et al. [11] focused on CRM intervention in acute care. Both of these contributions are examples of research that

have been published. The other evaluations only cover papers that adhere to a particular methodology. For instance, Fung et al. [14] only considered randomized controlled trials, quasi-randomized controlled trials, controlled before-after studies, or interrupted time series in their analysis. Since the release of our systematic review in 2010 [8,] there has not been any updated overview of the extensive variety of team interventions that are not restricted in any way, whether it be with regard to the type of team intervention, the healthcare context, the type of team, or the research methodology. On the basis of the numerous and diverse literature evaluations that have been carried out over the course of the past few years, we are able to assert that the information regarding how to enhance the efficacy of teams (and the results that are associated with them) has advanced rapidly, but at the same time, it is highly dispersed. Consequently, it is crucial to do an updated systematic review that covers the last ten years.

The use of anesthesia is an essential component of clinical dentistry. It provides care that is painless and assists a dentist in performing their work in the most comfortable manner possible. Fear is induced by painful dental treatments, and fear and anxiety both increase the amount of pain that is experienced. The delivery of local anesthesia to children is connected with pain and discomfort, as well as fear and worry being experienced by the child. Anxiety and pain are closely related to one another, and there is a close relationship between the two. The administration of local anesthesia through injection is still the method that is utilized the most frequently in the field of dentistry [15]. An application of topical local anesthetic drugs is made in order to reduce the amount of discomfort that is caused by the injection. Anesthetics that are used topically alleviate the discomfort that is associated with needle penetration. Topical medications can be applied in the form of a gel, liquid, spray, ointment, or patch. While benzocaine is the most commonly used topical anesthesia, it is also the one that has the quickest onset of action. A topical anesthesia agent is placed beforehand to the site where the local anesthesia is administered in order to reduce the amount of discomfort experienced. Nevertheless, localized allergic reactions may manifest themselves following extended or repeated usage of the substance. In

addition, there is a concern over the potential for methemoglobinemia while using compound topical anesthetics and lidocaine [16].

When it comes to offering relief from dental pain, local anesthetic is the most effective and successful method. In order to alleviate pain and discomfort, there is a wide variety of local anesthetic drugs available. In most cases, children will have a negative reaction to dental anesthetic, which may include a lack of cooperation with dental therapy and hysterical behavior. This will make it impossible for the dentist to do the process in the correct manner. Dental fear is primarily caused by a sense of loss of control and pain perception, which may come from a child's knowledge of teeth and previous painful experience. However, not all children are impacted by actions, as dental fear is mostly caused by a child's awareness of teeth. The procedures for administering local anesthetic are rather difficult to perform and master based on the amount of expertise one has. In addition, it is difficult to manage pediatric patients during dental procedures while simultaneously giving local anesthesia [16].

The use of local anesthetic in conjunction with general anesthesia has not been found to result in any significant change in postoperative pain, according to research that contradict each other. It has also been hypothesized that topical anesthetics can minimize postoperative pain following general anesthesia; however, Gazal et al. did not identify any difference between the situation in which topical anesthetics were used and the one in which they were not used. Although there have been some authors who have voiced concern that the addition of local anesthesia may lead to an increase in lip and cheek biting, there has not been shown to be a statistically significant link between lip and cheek biting and local anesthesia [17].

An investigation that was conducted not too long ago among pediatric dentists and general dentists who are members of the American Academy of Pediatric Dentistry (AAPD) on their utilization of local anesthetic on children who were receiving dental rehabilitations while under general anesthesia revealed a wide range of practices and justifications [18].

Conclusion:

The workforce in primary care dentistry has seen significant transformations in terms of both its makeup and its work patterns over the course of the past decade; nonetheless, the utilization of skill-mix continues to be restricted. As a means of optimizing a future workforce that is sustainable, it is necessary to take into consideration the elements that determine the career evolution of dentists and other dental care professionals. In particular, the administration of analgesia and the management of postoperative pain are essential components of the treatment plan, particularly when dental rehabilitations are performed under general anesthesia. It is important for the dentist and the anesthesia department, along with the respiratory therapist and nursing staff, as well as the radiology department and any other potential healthcare providers, to work together in order to predict and alleviate the postoperative pain that patients experience.

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