Stress and Anxiety in Patients undergoing Dental Extraction

ABSTRACT
Dental treatment involving anesthetic injection and surgical extraction of teeth causes stress and anxiety, resulting in emotional uneasiness, prolonging the intervention and complicating postoperative recovery. A dental surgeon should consider that patients initially visit a dental office for treatment of surgical extraction of teeth with severe dental stress and anxiety which could be due to conditioning or learned responses which these patients might have experienced. Thus, a prior awareness of the patient’s predisposition to dental stress and anxiety must be assessed, enabling to take appropriate measures preoperatively to give anxiety-free dental treatment and better postoperative recovery.

Keywords: Dental anxiety, Dental extraction, Dental stress, Preoperative anxiety.

INTRODUCTION
Anxiety is a frequent problem among dental patients. The dental environment may be a source of stress for any patient. Such stressful conditions may provoke fear and anxiety. Anxiety is a frequent problem among dental patients in general and especially children. Psychological stress as a result of fear and anxiety can produce effects in a variety of physiological systems inclusive of the sympathetic or autonomic system and the hypothalamus-pituitary-adrenal (HPA) axis. Fear and anxiety increase the activity of the HPA axis which in turn, enhances secretion of cortisol. Cortisol also known as the stress hormone, is secreted from the adrenal cortex and dispersed to all body fluids, and can be detected in urine, serum, and saliva. Heightened cortisol levels are thus indicative of increased stress as a result of elated fear and anxiety. The removal of wisdom teeth is a routine dental extraction procedure. Within this group of patients lie fairly major differences, since some may enter and leave having received treatment within an hour, whereas others may have to stay for up to 4 hours and sometimes longer depending upon the type of anesthesia and any postanesthetic complications. While some of this variation reflects a consideration of concurrent medical conditions, degree of difficulty, and the patient’s anxieties and preferences, much of it undoubtedly reflects our current ignorance; in particular, whether the longer and more costly general anesthesia protocol leads to a reduction in patient anxiety and stress. Although this would appear to be an obvious assertion, there appears to be no evidence in the literature that this is the case. To date, the use of salivary cortisol sampling as a measure of stress response does not appear to have been a technique used in oral and maxillofacial surgery, which is well-known to involve procedures which patients find particularly stressful. The purpose of this review is to study the techniques to assess stress and anxiety in patients undergoing extraction of teeth either by local or general anesthesia.

Anxiety and Pain
Perceived pain in relation to a dental treatment, Hakeberg and Cunha demonstrated that even though patients generally report higher anxiety toward dental treatment, it was shown that perceived pain is correlated with higher anxiety toward different aspects of a dental hygiene treatment. van Wijk and Makkes demonstrated that anxious patients report more perceived pain than nonanxious patients while receiving a local anesthesia injection, and Klages et al showed that patients with high anxiety report and anticipate more pain when exposed to a critical situation.

Anxiety and Previous Traumatic Dental Experience
In regard to the effect of a prior traumatic experience on dental anxiety, Agdal et al showed that anxious patients...
might experience intrusive recollection of earlier dental experiences, similar to patients with posttraumatic stress disorder. Locker et al\textsuperscript{14} also suggested that a negative dental experience is the most stated single cause of dental anxiety. In addition, van Wijk et al\textsuperscript{15} demonstrated that people’s expectations of pain could make them susceptible to ending up in a vicious circle of anxiety, fear of pain, and treatment avoidance. A study done by Sadi et al\textsuperscript{16} did reveal a significant correlation between dental anxiety and a prior traumatic dental experience.

**Anxiety, Stress, and Salivary Cortisol**

A study by Krueger et al\textsuperscript{17} showed that patients who have higher anxiety showed significantly higher salivary cortisol levels in an educational session compared to those who had a low dental anxiety score. In addition, a study by Koray et al\textsuperscript{18} found a positive association between state/trait anxiety scores and salivary cortisol in patients with oral lichen planus. Furthermore, in a study by Miller et al,\textsuperscript{19} it was demonstrated that salivary cortisol levels in dental treatment are highest in patients undergoing tooth extraction compared to other procedures, such as prophylaxis, restorative, and examination.

**Dental Anxiety Scale, Flow Rate, and Salivary Alpha Amylase**

Studies by Rohleder et al,\textsuperscript{20} Allwood et al,\textsuperscript{21} and Kang et al\textsuperscript{22} looked at the correlation between stress conditions, including psychological stress, and the levels of salivary alpha amylase (sAA). They all showed that stress causes a significant increase in sAA levels when patients were exposed to a stressful condition compared to a rest condition. In addition, Noto et al\textsuperscript{23} looked at the correlation between state/trait anxiety scoring and alpha amylase levels and found a significant correlation. Our study was the first, to our knowledge, to examine the correlation between dental anxiety scale (DAS) and sAA; nevertheless, our results did not reveal any significant correlation, and there were no significant differences based on age, gender, and race. In the study by Rohleder et al,\textsuperscript{20} the effects of flow rate on sAA levels were examined in both baseline and stress conditions, and it was concluded that the sAA and sAA output responses to stress were significantly higher in both parameters; therefore, the stress response was the same irrespective of flow rate. In regard to the correlation between alpha amylase level and volume of saliva collected, the study done by Sadi et al\textsuperscript{16} revealed a positive correlation between sAA level and volume of saliva collected. Sadi et al\textsuperscript{16} concluded that the presence of pain and any history of traumatic dental experience are associated with patients’ dental anxiety level. As far as the type of traumatic dental experience is concerned, a painful local anesthesia injection was found to be associated with the anxiety experienced by patients compared to other types of traumatic experiences. Dental anxiety, nevertheless, was not found to be associated with an increase in salivary cortisol or sAA levels, and there were no differences between gender, race, and age.

**Management of Dental Stress and Anxiety**

With regard to treatment of dental fear and anxiety, there are a number of possible avenues to explore with patients, including pretreatment anxiety questionnaires, cognitive behavioral therapy, relaxation therapy, computer-assisted relaxation learning, hypnotherapy, group therapy, individual systematic desensitization, pharmacological, flooding (implosion), and swallowing relaxation. These forms of treatment are essentially a form of counter conditioning to reverse the fear into a state of acceptance and calm.\textsuperscript{24}

**CONCLUSION**

Despite the latest scientific and technological advancements, dental treatment, especially extractions are still not agreeable and pleasant for most people, and visiting the dentist frequently generates a great deal of anxiety and stress to the patients. The present article has highlighted the possible reasons of dental stress and anxiety toward dental extraction, their origins in dentistry, and current knowledge on management of patient with fear and anxiety toward dental extraction. Understanding the origin of a patient’s fear and anxiety could help enhance patient management and care.

**REFERENCES**

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