

REVIEW ARTICLE

Stress and Anxiety in Patients undergoing Dental Extraction

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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.

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INTRODUCTION

Anxiety is a frequent problem among dental patients. The dental environment may be a source of stress for any patient.¹ Such stressful conditions may provoke fear and anxiety.^{2,3} Anxiety is a frequent problem among dental patients in general and especially children.^{4,5} 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.⁶ 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.⁷ Heightened cortisol levels are thus indicative of increased stress as a result of elated fear and anxiety.⁸ 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.⁹ 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 Cunha¹⁰ 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 Makkes¹¹ demonstrated that anxious patients report more perceived pain than nonanxious patients while receiving a local anesthesia injection, and Klages et al¹² 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 al¹³ showed that anxious patients

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might experience intrusive recollection of earlier dental experiences, similar to patients with posttraumatic stress disorder. Locker et al¹⁴ also suggested that a negative dental experience is the most stated single cause of dental anxiety. In addition, van Wijk et al¹⁵ 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 al¹⁶ did reveal a significant correlation between dental anxiety and a prior traumatic dental experience.

Anxiety, Stress, and Salivary Cortisol

A study by Krueger et al¹⁷ 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 al¹⁸ 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,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,²⁰ Allwood et al,²¹ and Kang et al²² 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 al²³ 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,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 al¹⁶ revealed a positive correlation between sAA level and volume of saliva collected. Sadi et al¹⁶ 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.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

1. Patil SJ, Shah PP, Patil JA, Shigli A, Patil AT, Tamagond SB. Assessment of the changes in the stress-related salivary cortisol levels to the various dental procedures in children. *J Indian Soc Pedod Prev Dent* 2015 Apr-Jun;33(2):94-99.
2. Pinkham, JR.; Berg, JH. The Practical importance of Pediatric Dentistry. In: Pinkham JR, Casamassimo PS, McTigue DJ, editors. *Pediatric dentistry: infancy through adolescence*. 5th ed. New Delhi: Saunders, An Imprint of Elsevier; 2005. p. 394-413.
3. Wright, GZ. *Behavior Management in Dentistry for Children*. Philadelphia: W.B. Saunders Co.; 1975. p. 146.
4. Milgrom, P.; Weinstein, P.; Getz, T. In: *Treating fearful dental patients. A patient management handbook*. 2nd ed. Continuing Dental Education, University of Washington: Seattle, Wash, USA: 1995. p. 90-91.
5. Gothi J, Upadhyay T, Vipul Modi V. Anxiety level in Indian basketball referees at different levels of officiating. *J Adv Develop Res* 2011;2(1): 84-86.
6. King SL, Hegadoren KM. Stress hormones: how do they measure up? *Biol Res Nurs* 2002 Oct;4(2): 92-103.
7. Abplanalp JM, Livingstone L, Rose RM, Sandwisch D. Cortisol and growth hormone responses to psychological

- stresses during the menstrual cycle. *Psychosom Med* 1997 May-Jun;39(3):158-177.
8. Craig A, Hancock K, Tran Y, Craig M. Anxiety levels in people who stutter: a randomized population study. *J Speech Lang Hear Res* 2003 Oct;46(5):1197-1205.
 9. Hill CM, Walker RV. Salivary cortisol determinations and self-rating scales in the assessment of stress in patients undergoing the extraction of wisdom teeth. *Br Dent J* 2001 Nov 10;191(5):513-515.
 10. Hakeberg M, Cunha L. Dental anxiety and pain related to dental hygienist treatment. *Acta Odontol Scand* 2008;66(6):374-379.
 11. van Wijk AJ, Makkes PC. Highly anxious dental patients report more pain during dental injections. *Br Dent J* 2008 Aug 9; 205(3):E7.
 12. Klages U, Kianifard S, Ulusoy O, Wehrbein H. Anxiety sensitivity as predictor of pain in patients undergoing restorative dental procedures. *Community Dent Oral Epidemiol* 2006 Apr;34(2):139-145.
 13. Agdal ML, Raadal M, Skaret E, Kvale G. Oral health and its influence on cognitive behavioral therapy in patients fulfilling the diagnostic and statistical manual of mental disorders-IV criteria for intraoral injection phobia. *Acta Odontol Scand* 2010 Mar;68(2):98-105.
 14. Locker D, Shapiro D, Liddell A. Negative dental experiences and their relationship to dental anxiety. *Community Dent Health* 1996 Jun;13(2):86-92.
 15. van Wijk AJ, Hoogstraten J. Experience with dental pain and fear of dental pain. *J Dent Res* 2005 Oct;84(10):947-950.
 16. Sadi H, Finkelman M, Rosenberg M. Salivary cortisol, salivary alpha amylase, and the dental anxiety scale. *Anesth Prog* 2013 Summer;60(2):46-53.
 17. Krueger TH, Heller HW, Hauffa BP, Haake P, Exton MS, Schedlowski M. The dental anxiety scale and effects of dental fear on salivary cortisol. *Percept Mot Skills* 2005 Feb;100(1): 109-117.
 18. Koray M, Dülger O, Ak G, Horasanli S, Uçok A, Tanyeri H, Badur S. The evaluation of anxiety and salivary cortisol levels in patients with oral lichen planus. *Oral Dis* 2003 Nov;9(6):298-301.
 19. Miller CS, Dembo JB, Falace DA, Kaplan AL. Salivary cortisol response to dental treatment of varying stress. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1995 Apr;79(4): 436-441.
 20. Rohleder N, Wolf JM, Maldonado EF, Kirschbaum C. The psychosocial stress-induced increase in salivary alpha-amylase is independent of saliva flow rate. *Psychophysiology* 2006 Nov;43(6):645-652.
 21. Allwood MA, Handwerker K, Kivlighan KT, Granger DA, Stroude LR. Direct and moderating links of salivary alpha-amylase and cortisol stress-reactivity to youth behavioral and emotional adjustment. *Biol Psychol* 2011 Sep;88(1): 57-64.
 22. Kang Y. Psychological stress-induced changes in salivary alpha-amylase and adrenergic activity. *Nurs Health Sci* 2010 Dec;12(4):477-484.
 23. Noto Y, Sato T, Kudo M, Kurata K, Hirota K. The relationship between salivary biomarkers and state-trait anxiety inventory score under mental arithmetic stress: a pilot study. *Anesth Analg* 2005 Dec;101(6):1873-1876.
 24. Carter AE, Carter G, Boschen M, AlShwaimi E, George R. Pathways of fear and anxiety in dentistry: a review. *World J Clin Cases* 2014 Nov 16;2(11):642-653.