Dental Research Journal

Original Article

The relation of preoperative stress and anxiety on patients' satisfaction after implant placement

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ABSTRACT

Background: There are some factors which can affect preoperative patient anxiety such as the necessity of procedure, postoperative pain, and patient's conception of his body image. The aim of this study was to assess the relation of patients' preoperative anxiety and postoperative patients' satisfaction in dental implant surgery.

Materials and Methods: Dental implants were placed in 40 patients (19 male and 21 female) who were referred to Dental Implant Surgery Department in Imam Reza clinic, during March–December of 2014 in Shiraz. The procedures were performed with or without bone regeneration. Preoperative anxiety was evaluated using Corah Dental Anxiety Scale, and postoperative satisfaction was determined on the basis of pain intensity, bleeding tendency, inability to eating, and overall satisfaction by filling a questionnaire in the 2nd or 3rd week after surgery. Data were collected and analyzed using Mann-Whitney test.

Results: Preoperative anxiety was detected as high in 10%, mild in 85%, and moderate in 5% of patients. Anxiety and depression score did not differ in both genders. There was no statistical difference between neither level of anxiety nor depression in both high and low educated patients. Postoperative bleeding, difficulty in eating, and overall satisfaction was nearly the same in both genders. Statistical analysis demonstrated a lower pain level and higher pain threshold in men than women ($P = 0.007$). Patients' age was not related to anxiety, depression, amount of bleeding, pain, and difficulty in eating. Overall dental care satisfaction was similar in both men and women.

Conclusion: The results of the study indicated that while anxiety does play a role in the perception of pain by patients undergoing implant surgery, overall patient satisfaction and post surgical outcomes did not significantly differ.

Key Words: Anxiety, dental, implant, stress, surgery

Received: February 2016
Accepted: June 2017

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INTRODUCTION

Anxiety is an emotional response known as stress and concern caused by an impalpable and promoting danger, which can activate the autonomous nervous system. Any change which causes the need of adjustment and physical, mental, and emotional reaction, is known as stress.[1]

According to the International Association for the Study of Pain is described as: "An unpleasant sensory

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Website: www.drj.ir
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www.ncbi.nlm.nih.gov/pmc/journals/1480

How to cite this article: Khorshidi H, Lavaee F, Ghapanchi J, Golkari A, Kholousi S. The relation of preoperative stress and anxiety on patients' satisfaction after implant placement. Dent Res J 2017;14:351-5.

and emotional experience associated with actual or potential tissue damage or described in terms of such damage."[2]

There are some factors which can affect preoperative patient anxiety such as the necessity of surgery, postoperative pain, and patient's verification of his body image. Anxiety is a kind of response to an unknown and unpredictable situation which triggers the physiologic response such as increased postoperative pain, delay in wound healing, immune system response,[3] higher risk of infection, increased dose of anesthesia, and pain relieving medications. These drugs have some side effects such as respiratory depression. On the other hand, less activity of patients increases the risk of thrombosis and bowel disease.[4,5]

Starkweather *et al*.[6] found that elevated stress and anxiety in the patients undergoing spinal surgery were associated with decreased immune system function that was measured by levels of natural killer cell activity and interleukin-6.

Stress has been associated with dental treatments, especially surgical procedures. A dental implant can be used to support a dental prosthesis, facial prosthesis or to act as an anchor.

Many studies found a relation between stress and the amount of patient pain during and after implant surgery.[2,7]

The basis of using dental implants is osseointegration where biocompatible materials, such as titanium, form an acceptable stress bearing bond to bone.[8]

Anxiety causes uncooperation during implant surgery and extended the duration of surgery, insufficiency of injected local anesthesia and ultimately patient dissatisfaction.

González-Lemonnier *et al*. showed that low preoperative anxiety was reported in 27.8% of patients, moderate in 50%, and high in 22.2%. In this study, younger patients and women were reported to have statistically significant more anxiety. The higher preoperative anxiety was led to statistically more significant patient dissatisfaction. However, it had no effect on postoperative surgery satisfaction.[9]

Muglali and Komerik studied the anxiety of patients before, immediately after, and 1 week after minor oral surgery. The results showed that preoperative anxiety levels were significantly higher than the postoperative anxiety levels ($P = 0.001$). There were positive relations between the expected amount of pain with preoperative anxiety and real pain experienced during surgery with postoperative anxiety ($P = 0.001$).[10]

Morino *et al*. compared pre- and post-operative salivary stress biomarkers chromogranin A (CgA) in patients who received only local anesthesia and those who received additional intravenous sedation for dental implant insertion. They reported statistically significant higher levels of CgA ($P < 0.05$) at baseline in patients who received sedation compared to those who did not, whereas, the amount of CgA showed no difference in comparison with its level before surgery.[11]

As we previously mentioned, pretreatment stress is not rare with the prevalence of 22.2%–50% in the patients undergoing dental implant surgeries. Concerning the high prevalence of surgery-related-anxiety, its side effects, and its possible influence on the final results and satisfaction of patients, it would be necessary to evaluate and finally manage this anxiety during any dental surgical procedures such as implant surgery.

Dental treatment-related anxiety is one of the most challenging preoperative complications of dental implant surgery. The current study was designed to evaluate that how the level of stress can effect postoperative satisfaction.

MATERIALS AND METHODS

Patients who were referred to a Dental Implant Surgery Clinic in Shiraz, Iran, from March to December 2014 were invited to participate in this prospective study.

Fifty-seven patients who met the inclusion criteria: Age over 18 years, with no significant systemic diseases (American Society of Anesthesiologists I or II), of both sexes, and indicated for single tooth dental implants replacement, enrolled to participate in this prospective study, from which, forty patients who had the first dental implant surgery were selected. Demographic data and relevant medical and social histories were taken.

All the patients with systemic disease, psychological disorders and those who were not available for postsurgical follow-ups or could not completely fill the questionnaires were excluded from the study. Since the broad spectrum of interventions is involved with major implant surgeries and hospitalization of patients might sometimes be necessary, the patients

who needed major implant surgical intervention also were not included in this study.

Each patient signed a written consent form. All operations were conducted by a single experienced periodontal surgeon using conventional dental local anesthesia (lidocaine with epinephrine). Patients were asked to fill one questionnaire before and another 2–3 weeks after surgery.

The Corah's scale (Corah Dental Anxiety Scale [DAS]),[12] which evaluates patients' stress, anxiety, and depression, was used as the preoperative questionnaire. The Corah's scale has five questions. Each question has 5 possible answers, ranging from 1 (no anxiety) to 5 (high anxiety). Therefore, the possible score ranges from 4 to 20. Anxiety is considered low when scores are ≤6, moderate with scores between 7 and 12, and high with scores ≥13.[13]

The second questionnaire registered the possible problems after oral surgery. This questionnaire was evaluated regarding its validity and reliability by the community specialist in social dentistry involved with the study (Golkari). Patients' demographic data were obtained from their registered records.

Patients were recalled for the first assessment session of the success of surgery 2–3 weeks after the operation. At this time, they were asked to fill in the postoperative questionnaire, which was focused on overall patient satisfaction, presence, or absence of bleeding, pain, and possible difficulty in speech or eating after surgery. Visual analog scale (VAS) was used for evaluating pain. VAS is a ten graded score from 0 (no pain) to 10 (the most sever possible pain).

The relationship of these outcome measures with patients' demographic data and their Corah's score were evaluated using Chi-square and Mann–Whitney test. The correlations between variables were assessed using Spearman's rank correlation coefficient as most variables did not have a normal distribution. SPSS (PASW version 18, SPSS Inc, Chicago) was used for data entry and analysis and values of $P < 0.05$ were considered statistically significant.

RESULTS

In this study, 19 men and 21 women have been participated. Their age range was between 20 and 65 years with the mean of 41.72 ± 12.98 years. Nearly 50% of the participants were academic educated, and 50% of them had primary education.

Table 1 declares the relationship between anxiety, depression, pain, difficulty in eating, and overall satisfaction of the patients according to the gender and level of education.

The result of this study did not show any significant difference between anxiety in men and women ($P = 0.848$) and also between high- and low-educated patients ($P = 0.092$). The difference between depression scores in men and women ($P = 0.226$) and primary and high educated participants also ($P = 0.253$) were not significant.

Moreover, statistical analysis did not reveal any statistically significant difference between postsurgical outcomes such as postoperative bleeding, difficulty in eating, and overall satisfaction in both genders and any level of patients' education. Pain intensity score, VAS, also was similar in both level of patient education, but only the mean of pain intensity in men and women had a significant difference. The results reported lower pain levels and higher pain threshold in men in comparison to women ($P = 0.007$).

Table 2 summarizes the distribution of anxiety and depression score in relation to bleeding, pain and difficulty in eating score.

A significant association was not detected between anxiety and depression and the average amount of bleeding, pain intensity, and difficulty in eating.

There was no significant difference between patients satisfaction and anxiety ($r = 0.062$, $P > 0.05$), depression ($r = -0.26$, $P > 0.05$), amount of bleeding ($r = 0.056$, $P > 0.05$), difficulty in eating ($r = 0036$, $P > 0.05$), and pain intensity ($r = -0.091$, $P > 0.05$).

Patients age was not correlated with anxiety ($r = -0.082$, $P > 0.05$), depression ($r = -0.109$, $P > 0.05$), amount of bleeding ($r = 0194$, $P > 0.05$), pain ($r = 0.018$, $P > 0.05$), and difficulty in eating ($r = -0.138$, $P > 0.05$).

DISCUSSION

A significant relation between VAS and gender of participants has been in this study. The relation of anxiety and depression with amount of bleeding, pain intensity (VAS), and difficulty in eating were not statistically significant.

In current research, 10% of the participants reported symptoms of severe anxiety and 85% had mild, and

Table 1: The relation between anxiety, depression pain, difficulty in eating, and overall satisfaction of the patients according to the gender and level of education

Number of patients	Sex		*P*	Education		*P*
	Female (*n*=21)	Males (*n*=19)		Diploma (*n*=20)	Have a college degree (*n*=20)	
Anxiety score	3.00 (8±12.34)	3.00 (4.31±4.39)	0.848	6 (7.95±10.40)	2 (4.55±8.45)	0.092
Depression score	7 (9.66±9.93)	5 (5.94±5.12)	0.226	5.5 (6.1±10.40)	7 (9.7±10.10)	0.253
Bleeding score	4.75 (4.51±2.05)	4.25 (4.31±1.88)	1.00	3.87 (4.15±2.42)	4.75 (4.68±1.33)	0.357
Pain score	5.75 (6.02±2.05)	4.50 (4.36±1.29)	0.007	4.50 (5.17±2.33)	5.37 (5.30±1.41)	0.398
Difficulty in eating	5.50 (5.60±1.36)	5.50 (5.21±1.98)	0.860	5.50 (5.51±2.23)	5.50 (5.32±0.87)	0.738
Satisfaction	9.00 (8.76±1.48)	9.00 (8.53±1.54)	0.601	9.50 (8.75±1.55)	9.00 (8.55±1.46)	0.498

Table 2: The correlation of anxiety and depression score in relation with bleeding, pain and difficulty in eating score

Evaluated factors	Bleeding		Pain		Difficulty in eating	
	*r**	*P*	*r**	*P*	*r**	*P*
Anxiety	0.026	0.874	0.160	0.325	0.162	0.319
Depression	−0.095	0.558	0.135	0.407	−0.043	0.792

*Spearman's correlation coefficient

5% had moderate level of anxiety before the procedure can be Corah DAS is widely used for anxiety scoring. Many clinical studies indicate that like other dental treatments, dental implant surgeries also cause a different range of anxiety.[14-16] Many studies like this study, reported higher anxiety scores of women than men.[14] It seems that women may easily display their feelings of fear during dental treatment better than men. Although women have more fear of surgery and dental procedures, they have more regular dental visits. Authors believed the gender could influence the capability of managing fear. Usually, fear is known as an important reason for not referring to dentists.[17]

Hüge *et al*. reported that the lower educated participants were more likely seeking various dental treatments; hence, they were more prone to excessive fear. According to their findings, education had no statistically significant impact on their anxiety and stress level.[18] The current study has also experienced the same results and found no significant relation between the level of education and the anxiety of patients.

Patient's environment and family (theory of model learning) have some effect on expressing fear and its development into the varying levels of dental anxiety.[19] Another study reported that one-third of the patients introduced their fear of injection as the main reason for their anxiety.[20] In our study also most of the patients' fears might be in some extent to the injection procedure.

After 4 days, the researchers examined the patients to see the wound healing, implant position and at the same time they evaluated the VAS (pain score). We chose the 4th day after the procedure because it was a proper time for surgical dressing exchange and postsurgical evaluation of the wound. Most of the patients did not have a complaint of severe pain and reported the procedure not so difficult and painful. Our result was in coordination with Al-Khabbaz *et al*. findings,[21] which showed the highest mean pain scores at 24 h after surgery (2.01 ± 0.11) decreased slowly. Most of the patients reported mild intensity of pain while a few percent of them expressed moderate or severe pain. Surgeon experience, pain during surgery, and female gender had significant relation with pain after 24 h. Although multiple implant placement increased patient's anxiety, this was not statistically significant (P = 0.183).[21]

Lindeboom and van Wijk[22] compare flapless and flapped implant surgical techniques. The patients had more tolerable experience in flapless surgery. In this study, we used only flapped method for implant placement.

The dentist's skill to reduce the patient's anxiety and postsurgical complications warrant the success of implant surgery.

In this study, the stress relative factors were evaluated before and after surgery. It can apparently provide the chance to evaluate and compare patients' anxiety and stress precisely which subsequently help to find the related effective factors. Furthermore, the authors have chosen implant surgery as one of the most stress-producing and common surgeries in dentistry.

It should be noted that current study do not represents the total population in terms of sex, age, and education distribution and is limited to a small part of a population, and hence more studies on larger sample is necessary for further evaluations.

CONCLUSION

The results of this study indicated while anxiety could play a role in the perception and reporting of pain by patients undergoing implant surgery, especially in women, but no significant association was found between the level of anxiety and depression with an average amount of bleeding, pain intensity, and difficulty in eating.

Financial support and sponsorship

This study has been supported by Vice Chancellor of Research Affairs, International Branch of Shiraz University of Medical Sciences of Iran for thesis #8693055, Dr. Sara Kholousi.

Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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