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Original Article

Preoperative anxiety decrease the postoperative satisfaction in anterior dental implant surgery

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Abstract: Background: Anterior dental implant surgery has a deep impact on aesthetic zone, and preoperative anxiety as a common clinical presentation effect the evaluation of patients in postoperative satisfaction. It is necessary tostudy the preoperative anxiety association with the postoperative satisfaction in anterior dental implant surgery. Methods: A total of 92 patients with anterior tooth missing were included and all were over 18 years old. Symptom Checklist 90 (SCL90) and State-Trait Anxiety Inventory (STAI), as well as pain Visual Analogue Scale (VAS) and Self-satisfaction evaluation, were used to test the psychological status of each subject. Results: There were no significant difference. between age, relationship status or health behaviors and pain or satisfaction (all *P* values >0.05). Most scores of SCL90-R did not show a significant difference between national norm of Chinese and participants. Concerning to the scores of VAS of pain and self-satisfaction, significant differences in trait and state anxiety were found. Moreover, correlation analysis showed that there are correlations between SAI, TAI and anxious (SCL90R) and the VAS of pain and self-satisfaction. Conclusion: These findings indicate that there is an explicitly relevance between preoperative psychological factors and postoperative outcomes in anterior dental implant surgery. In addition, preoperative anxiety contribute to the increase of pain in anterior tooth implantation surgery rather than age and gender.

Keywords: Anterior tooth missing, oralimplantology, symptom checklist, state-trait anxiety inventory

Introduction

Anxiety is an emotional reaction defined as chronic stress, apprehension, nervousness and concern caused , accompanied by activation of the autonomous nervous system [1] and often observed in dental procedures [2]. Dental anxiety is widespread among the patient population and shows a significant problem in the management [3]. Dental anxiety can result in a barrier for the patients to seek dental treatment and consequently compromise oral health [4]. Additionally, patients with anxiety are less cooperative during procedures and display lower degree of satisfaction with surgical treatments [5, 6]. Anxious patients are uncooperative during dental surgery, such as dental implantation, and complicate the procedure [7]. In dental implant surgery, local anesthesia can be insufficient to perform an adequate operation and patients fear to face the pain in the procedures [8]. Dental anxiety, by contrast, relates to the psychological and physiological variations of a non-pathological fear response to a dentist's appointment or treatment [9]. The cancellation, avoidance, or postponement of dental visits is a common observation among anxious and vulnerable individuals [10]. Considering dental anxiety before the dental implant, more than 70% of patients present moderate to high levels of anxiety. The more anxious patients were, the less patients satisfied with the procedure [11].

The Hopkins Symptom Checklist-90-revised Inventory (SCL90R) is a well-known self report instrument to assess the psychological symptom status of individuals from "healthy con-

trols" to "disordered ones" [12]. It consists of 90 questions defined in 9 symptoms dimensions (depression, anxiety, phobic anxiety, hostility, obsessive-compulsive, interpersonal sensitivity, somatization, paranoid ideation and psychoticism dimensions). A good level of consistency and test-retest reliability has been reported for SCL90-R [13]. The State-Trait Anxiety Inventory (STAI) has been used to evaluate anxiety in patients who undergo dental and buccomaxillofacial treatments, and young patients and women presented the highest levels of anxiety [16]. So we choose the SCL90R and STAIscales to measure the mental factors and anxiety in patients who undergo dental and maxillofacial treatments.

The loss of an anterior tooth influences the patient's aesthetics and has major detrimental implications for the subject, since it significantly affects the social integration and quality of life [14]. Dental implant surgery is a valid treatment procedure, to restore aesthetics in the anterior maxilla, However, patients with dental anxiety are less cooperative and more pain during procedures and display lower degree of satisfaction with surgical treatment in clinical experiences.

Because of the importance of this topic, investigating trait anxiety, state anxiety, and anxiety specifically associated with dental procedures of tooth implants for loss of anterior tooth is important. Given the growing demand for conscious intravenous sedation for dental implant surgery, it is interesting to know the grade of patient anxiety in dental implant surgery under conscious intravenous sedation. The aim is to study whether preoperative anxiety of the patient is influenced by age and sex and to compare the preoperative anxiety of the patient with the postoperative patient and surgeon satisfaction in dental implant surgery with local anesthesia and conscious intravenous sedation.

Materials and methods

Objectives

This was a randomized and prospective study evaluating general and dental anxiety in patients, and ethics approval for this study was granted by the Ethics Committee of Chongqing Medical University.

The subjects consisted of 92 patients with loss of anterior tooth (55 male and 37 female). All patients were over 18 years old with loss of anterior tooth and choosed dental implant as valid treatment procedure voluntarily. Patients with metastatic lesions, systemic diseases, a history of alcohol abuse or the use of drugs altering the immune response such as systemic corticosteroids and beta blockers within the last 6 months were excluded. Psychosocial questionnaires were completed during the preoperative appointment about two to four hours before their surgery.

Behavioral, demographic, and medical assessments

Demographic, health behavior, clinical information and histopathological data were obtained from medical records. Detailed information on hours of sleep, smoking, alcohol and caffeine intake during the 7 days immediately preceding surgery was also collected.

All subjects received theSCL90R, a comprehensive self-assessment survey of 90 questions, which rates a broad range of psychiatric symptoms over the previous 7 days on a 5 point scale, and a demographic questionnaire. In the SCL90R subjects responded on a five point scale of distress ranging from "not at all" (0) at one pole to "a little bit" (1), "moderately" (2), "quite a bit" (3) and "extremely" (4) at the other pole. The 90 items of the SCL90R are grouped along ten symptom dimensions reflecting broad psychological symptom status in a spectrum of individuals. The dimension "psychoticism" (10 items) includes items indicative of a withdrawn, isolated, schizoid lifestyle as well as items representing symptoms of psychosis and schizophrenia such as hallucinations and thought broadcasting [12].

All subjects received the STAI, which comprises two scales (state anxiety and trait anxiety), each with 20 affirmatives for which 1 to 4 points can be assigned. The four response categories for state anxiety are 1 (absolutely not), 2 (a little), 3 (a lot), and 4 (very much). The four response categories for trait anxiety are 1 (almost never), 2 (sometimes), 3 (frequently), and 4 (almost always). The response items were placed in such a way that sometimes response 4 indicated a high anxiety level and

Table 1. General information

	Sample (N=92)
General information	
Age (mean ± Sd)	35.0 ± 12.9
Gender (range)	(18, 65)
Male %	55 (59.8%)
Marital Status, %	
Single	27 (29.3%)
Married/living with partner	52 (56.5%)
Divorced/separated	10 (10.8%)
Widowed	3 (3.2%)
Educational Background, %	
Under a high schooleducation	6 (6.5%)
Senior High Schooleducation	29 (31.5%)
University degree	45 (48.9%)
Master degree or above	12 (13.1%)
Quantity of loose anterior tooth	
1	59 (64.1%)
2	18 (19.6%)
≥3	15 (16.3%)
Reason of tooth loose	
Trauma	54 (58.7%)
Congenital reason	19 (20.6%)
Periodontitis	10 (10.9%)
Other	9 (9.8%)
Scals scores	
SCL90	134.4 ± 29.6
SAI	42.61 ± 7.2
TAI	39.7 ± 5.7
VAS of pain	6.43 ± 2.14
VAS of satisfaction	5.61 ± 1.82

Table 2. Comparison of scores of SCL90 between patients with anterior tooth missing and national norm

	Norm (N=1388)	Sample (N=92)
Somatization	1.37 ± 0.48	1.40 ± 0.27
Obsessive-compulsion	1.62 ± 0.58	1.58 ± 0.54
Sensitive	1.65 ± 0.61	1.66 ± 0.42
Depression	1.50 ± 0.59	1.52 ± 0.43
Anxiety	1.39 ± 0.43	1.57 ± 0.41
Hostility	1.46 ± 0.55	1.49 ± 0.31
Phobic anxiety	1.23 ± 0.41	1.20 ± 0.25
Paranoid ideation	1.43 ± 0.57	1.39 ± 0.24
Psychosis	1.29 ± 0.42	1.32 ± 0.27

sometimes it indicated a low anxiety level to avoid the patient responding with the same numbered responses all of the time [6, 15]. The scores for each scale varied from 20 to 80, in which higher scores indicated higher anxiety. Individuals with scores <33 were classified as low anxiety. Individuals with scores between 34 and 44 were classified as moderate anxiety. Individuals with scores >45 were classified as high anxiety. The classifications for trait anxiety are relatively stable, whereas the classifications for state anxiety can vary rapidly as a function of anxiogenic stimuli [6, 15].

All subjects received the Visual Analogue Scale (VAS) card, which is supervised by Chinese medical association. The VAS card is about 10 cm long and ranges from “no pain” (0) at one pole to “unbearable pain” (10) at the other pole. The card is finished immediately after the implant surgery.

All subjects received the self-satisfaction card, which is supervised by ourselves. The self-satisfaction card is about 10cm long and ranges from “most dissatisfaction” (0) at one pole to “most satisfaction” (10) at the other pole. The card is finished after the upper restoration is finished.

Statistical analyses

SPSS version 19.0 (SPSS, Inc., Chicago, IL) was used for data analysis. The scores in each compartment were examined using Pearson’s correlation co-efficient. Categorical variables were tested using either Chi Squared tests or analyses of variance (ANOVA). A p value of <0.05 was considered statistically significant.

Results

Participant characteristics

Table 1 presents demographic characteristics by compartment. Among the 92 patients, 59.8% (n=55) were men. The main reasons for losing of anterior tooth of the patients reported are a traumatizing experience (58.7%, n=54), congenital reason (20.6%, n=19), periodontitis (0.9%, n=10). There were no significant associations between age or health behaviors and pain or satisfaction (all P values >0.05). There were no significant associations of relationship status (single vs. divorced/separated/widowed vs. married) with pain or satisfaction in any compartment (all P values >0.05).

Table 3. Scores of classified by State Anxiety Inventory (SAI) and Trait Anxiety Inventory (TAI)

	SAI group		TAI group	
	samples	scores	samples	scores
Low	17	32.6 ± 6.5	26	31.9 ± 5.2
Medium	42	41.5 ± 3.1	36	40.1 ± 3.0
High	33	49.2 ± 4.7	30	46.1 ± 3.4

Table 4. Postoperative pain and self-satisfy scores in patients with different anxiety levels classified using SAI and TAI

		VAS of Pain		VAS of Satisfaction	
SAI	Low	5.53 ± 2.18	P<0.05	7.29 ± 1.32	P<0.05
	Medium	6.41 ± 1.93		5.77 ± 1.36	
	High	7.01 ± 2.26		4.48 ± 1.89	
TAI	Low	5.73 ± 2.03	P<0.05	6.96 ± 1.50	P<0.05
	Medium	6.41 ± 2.00		5.47 ± 1.53	
	High	7.06 ± 2.31		4.60 ± 1.73	

Table 5. Correlation analysis between the postoperative pain and self-satisfy scores with stage and SAI or TAI

		R*	*P*
VAS of Pain	SAI	0.471	0.024
	TAI	0.528	0.041
	Anxious (SCL90)	0.512	0.043
VAS of Satisfaction	SAI	0.492	0.031
	TAI	0.573	0.047
	Anxious (SCL90)	0.494	0.039

*: P<0.05.

Factor analysis identifying SCL90-R symptom dimensions

Most dimension scores of SCL90-R did not show a significant difference between norm of chinese and sample. The scores of somatization (1.40 ± 0.27), sensitive (1.66 ± 0.42), depression (1.52 ± 0.43), anxiety (1.57 ± 0.41), hostility (1.49 ± 0.31) and psychosis (1.32 ± 0.27) of patients with anterior tooth lost are higher than norm of Chinese respectively [16] (**Table 2**).

Factor analysis identifying STAI symptom dimensions

For anxiety levels, we devide the patients into three group by scores of State Anxiety Inventory (SAI) and Trait Anxiety Inventory (TAI) (**Table 3**). Concerning to the scores of VAS of pain and self-satisfaction, significant differences in trait and state anxiety were found. For state anxiety, the scores of VAS of pain differed substantially, with group SAI_{low} showing comparatively lower scores (5.53 ± 2.18), the scores of group SAI_{med} (6.41 ± 1.93) and group SAI_{high} are higher, and there are significant differences using pairwise comparison methods (P<0.05). For state anxiety, the scores of self-satisfaction differed substantially. It is clear that the result of scores was SAI_{low}>SAI_{med}>SAI_{high}, and there are significant differences using pairwise comparison methods (P<0.05). The same trend could be observed in TAI group (**Table 4**). Moreover, correlation analysis sho-wed that there are correlations between SAI, TAI and anxious (SCL90R) and the VAS of pain and self-satisfaction (**Table 5**).

Discussion

In the present study, placement of dental implants is one of the most anxiety-provoking oral surgery procedures [17], and the finding shows that patients always avoide dental treatments especially procedures that involve surgery, such as dental implants [18]. However, the loss of an anterior tooth influences the patient's aesthetics, social integration and quality of life, so that a dental implant surgery is always one of the most reasonable choice.

The present study have showed that the levels of anxiety are associated with the expectancy of pain [19]. Oral surgeries, despite not being life-threatening and associated with rapid recovery, cause physical and psychological effects in individuals who have high expectations, thus determining an unpleasant experience [17].

Anxiety feelings associated with treatment results were determined in this study, which was an expected result. With regard to dental anxiety, Elter et al reported that mild levels of dental anxiety is consistent with the results [20]. We also found no association with gender, in agreement with previous authors, a finding previously reported by Kanegane et al [21].

In our study, 81.5% of patients had moderate to high levels of anxiety during the dental implant surgery. These results are higher than previous

studies (72.2%) [22]. Considering that dental anxiety is related to prior dentistry experience, we observed that the patients who had higher dental anxiety were the ones who had reasonable or traumatizing dental experiences. We used three validated scales in the present study: STAI-trait, STAI-state, and SCL90R-anxious. The STAI appeared to be more sensitive than SCL90R for measuring fluctuations in anxiety levels, although SCL90R assess the psychological symptom status of individuals from "healthy controls" to "disordered ones" [12]. Therefore, we suggest using both scales in the evaluation of anxiety in dentistry.

The key findings of this study are that the trait and state anxious levels in patients are linked to dental implant treatment results. In our study, a higher anxious level was associated with increased pain and decreased satisfaction. Indeed, our data and those of others suggest that patients needed dental implant have more emotional distress. This is essential to provide the adequate support to the patient and a patient's quality of life.

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Disclosure of conflict of interest

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