

Psychological Assessment of Patients with Iatrogenic Trigeminal Nerve Injury Using Symptom Checklist-90-Revised

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Purpose: This study aims to assess the psychological characteristics of patients with iatrogenic damage of the trigeminal nerve using Symptom Checklist-90-Revised (SCL-90-R).

Methods: A total of 22 patients who visited the clinic of Department of Oral Medicine, School of Dentistry, Chosun University were evaluated in the months from December 2012 to December 2014. Patients were included in the study if they presented with reported sensory changes due to iatrogenic trigeminal nerve injury. A total of 37 control group who has no symptoms of pain and sensory change were included in the study. All participants filled out the SCL-90-R instrument to assess psychosocial symptoms.

Results: The T-scores of most of the SCL-90-R symptom dimensions were within normal range (less than 55) in the patients and the control group. The patients group showed higher T-scores of SCL-90-R than those of the control group, with statistically significance of somatization, anxiety, psychoticism, and positive symptoms distress. Female patients group had higher T-scores of SCL-90-R than those of male patients group, but there was no statistical difference, except for the positive symptom global index. The chronic patients group showed higher T-scores of SCL-90-R than those of the acute patients group, but there was no statistical difference, except for the Positive symptom global index.

Conclusions: According to the psychological assessment of iatrogenic trigeminal nerve injury patients using SCL-90-R, the patients group, as compared to the control group shows a significantly higher score for somatization, anxiety, and psychoticism. Therefore, assessment of psychological state would be considered to treat patients with iatrogenic trigeminal nerve injury.

Key Words: Iatrogenic; Psychological tests; Symptom Checklist-90-Revised; Trigeminal nerve injuries

INTRODUCTION

Clinically, the problems with trigeminal nerve damage, caused by dental treatments would have been the sensitive and complex issues, because these are associated with not only patient discomfort and pain but also legal issues, such as medical litigation.¹⁻³⁾ Iatrogenic damage of the trigeminal nerve results in pain and disturbed sensations in affected patients, and practitioners can endure difficulties as a result. It is caused by dental treatments, such as delivery of local anesthetic, implant placement, orthognathic/ablative

surgery, impacted tooth extraction, tooth preparation mishaps, and endodontic treatment.⁴⁾

Permanent disturbed sensation was reported to occur in 1% to 8% of patients with dental implant placement,^{5,6)} 5% to 70% of patients who underwent orthognathic surgery,⁷⁻⁹⁾ and 0.3% to 1% of patients with third molar tooth extraction.¹⁰⁻¹²⁾ In addition, pain continues even after successful endodontic treatment in 3% to 13%,¹³⁻¹⁵⁾ because pricking of the needle during administration of local anesthesia can also result in damage to these nerves.¹⁶⁾ Iatrogenic damage to the trigeminal nerve causes hypoesthesia, anesthesia,

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paresthesia, dysesthesia, allodynia and dysgeusia resulting in discomfort and pain in the orofacial area.¹⁷⁾

Although the diagnosis and treatment of damage to the trigeminal nerve has been sufficiently studied, studies of the psychological factors related to the above are relatively rare. Patients complain of neurologic symptoms in the course of their daily functions, including speaking, eating, facial expressions, and shaving, and this discomfort adversely affects social relationships and eventually results in psychological problems.^{18,19)} Previous psychological assessments of patients with iatrogenic damage of the trigeminal nerve have been performed using non-standardized questionnaires.²⁰⁾ Recent studies have reported that patients with pain in the orofacial area experience the degradation in quality of life, psychosocial dysfunction, and increased anxiety and depression.²¹⁻²³⁾ Therefore, understanding the psychological state of patients would be important for communicating with them and anticipating and improving prognoses by characterizing their burdens of neurologic symptoms.

Subjective clinical interviews, objective standardized surveys, and inventory type methods could be used to evaluate the personality characteristics of patients. Modified and standardized tests for use among Korean include the Minnesota Multiphasic Personality Inventory,²⁴⁾ the Symptom Checklist-90-Revised (SCL-90-R),²⁵⁾ and the Social Readjustment Rating Scale.²⁶⁾ The SCL-90-R is a multidimensional instrument that utilizes self-reports and is composed of 90 items. It evaluates nine psychological states, including phobic anxiety, anxiety (ANX), depression, somatization (SOM), obsessive-compulsivity, distrust and interpersonal sensitivity, hostility, paranoid ideation, and psychoticism (PSY). The overall score of the SCL-90-R is used to represent psychoneuroticism. Each item describes a physical or psychological symptom that is rated on a five-point scale ranging from 0 (not at all) to 4 (extremely). Patients were asked to indicate the extent to which the symptoms from the SCL-90-R manifested for the past 7 days. In clinical practice, the SCL-90-R is used to reflect general symptom levels or the Global Severity Index (GSI) of the individual, as well as a more differentiated subscale profile. It was re-standardized in 1984 in Korea and has been clinically applied.²⁷⁾ The advantage of using the SCL-90-R is that it is completed in 20 minutes, with easy questionnaires that

include general symptoms, and the test and grading can be conducted by a nonprofessional. It can be used as a primary tool to screen patients who need professional help.

Therefore, the aim of this study was to assess the psychological characteristics of patients with iatrogenic damage of the trigeminal nerve using the SCL-90-R.

MATERIALS AND METHODS

1. Subjects

Among the patients who visited in the Department of Oral Medicine of Chosun University Dental Hospital (Gwangju, Korea), for seeking care or referred of neurologic symptoms after dental treatment, twenty two patients were included in this study, from December 2012 to December 2014. The control group comprised 37 patients without neurologic symptoms and chronic pain affected in orofacial area. This study was approved by the institutional review board of Chosun University Dental Hospital (CDMDIRB-0903-27).

2. Methods

In the patients group, the patient histories and clinical examinations were documented according to routine procedures for sensory alteration after trauma in the Department of Oral Medicine of Chosun University Dental Hospital. Demographic data collected from each patient included age of onset and gender.

The participants were given a set of SCL-90-R questionnaires at their first visit. They answered each questionnaire about their experiences over the previous 7 days, by selecting options among “not at all, slightly, modest, quite severe, and very severe”.

3. Statistical Analysis

The analyses were performed with IBM SPSS Statistics version 20.0 for Windows (IBM Co., Armonk, NY, USA). To compare the T-scores of SCL-90-R, the Mann-Whitney U tests were performed. Statistical significance was defined as $p < 0.05$, with a 95% confidence interval.

RESULTS

The average ages and the male : female ratio in each

group are listed in Table 1. The mean age of the patients group was 49.38±14.74 years, and that of the control group was 45.81±8.23 years.

The dental implant surgery was the most common procedure associated with nerve injury, followed by the third molar extraction (Fig. 1). The average duration from the occurrence of the trigeminal nerve damage to the first medical examination was 6.25±5.15 months, and 66.67% of the patients visited the clinic within 6 months after the neurologic symptoms had occurred (Fig. 2).

1. Comparison of T-scores of SCL-90-R between the Patients and Control Groups

Table 2 shows the comparison of T-scores of SCL-90-R between the patients and control groups. The T-scores in both groups were less than 55, except for the positive symptom total (PST) global index. The patients group had higher T-scores than those of the control group. In the comparisons of T-scores of the SCL-90-R symptom dimensions, 3 parameters (SOM, ANX, PSY) had statistically significant difference between the groups. Among three global indices, positive symptoms distress (PSDI) had statistically

Table 1. Comparison of age, male : female ratio among groups

	Patients (n=22)	Control (n=37)
Age (y)	49.38±14.74	45.81±8.23
Male : female	8 : 14	14 : 23

Values are presented as mean±standard deviation or ratio.

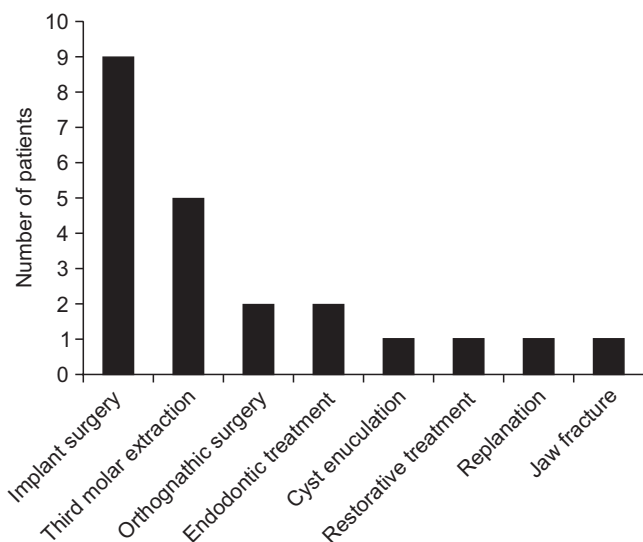


Fig. 1. Causes of trigeminal nerve injury after dental treatment.

significant differences.

2. Comparison of T-scores of SCL-90-R in the Patients Group Divided by Gender

Female patients group had higher T-scores of SCL-90-R than those of male group, but the difference was not significant, except for the PST global index (Table 3).

3. Comparison of T-scores of SCL-90-R in the Patients Group Divided by Symptom Duration

We divided the patients group into 2 subgroups according to time since nerve injury had occurred. Patients for whom

Table 2. Comparison of T-scores of SCL-90-R between the patients and the control groups (n=59)

	Patients	Control	p-value
SOM	46.87±7.75	42.35±4.23	0.024*
O-C	44.24±11.10	40.80±5.85	0.415
I-S	45.47±11.28	42.25±7.26	0.438
DEP	43.95±8.92	40.68±4.60	0.170
ANX	44.07±7.82	40.70±5.24	0.043*
HOS	45.60±9.30	42.16±5.26	0.350
PHO	47.19±12.55	43.14±4.26	0.481
PAR	46.27±13.00	43.73±6.25	0.900
PSY	45.00±9.60	41.16±4.18	0.032*
GSI	44.75±10.31	40.08±4.85	0.092
PSDI	53.77±10.33	46.88±9.19	0.009*
PST	65.37±11.84	61.43±8.01	0.221

SCL-90-R, Symptom Checklist-90-Revised; SOM, somatization; O-C, obsessive-compulsive; I-S, interpersonal sensitivity; DEP, depression; ANX, anxiety; HOS, hostility; PHO, phobic anxiety; PAR, paranoid ideation; PSY, psychoticism; GSI, Global Severity Index; PSDI, positive symptom distress index; PST, positive symptom total.

Values are presented as mean±standard deviation.

*p<0.05 (by Mann-Whitney U test).

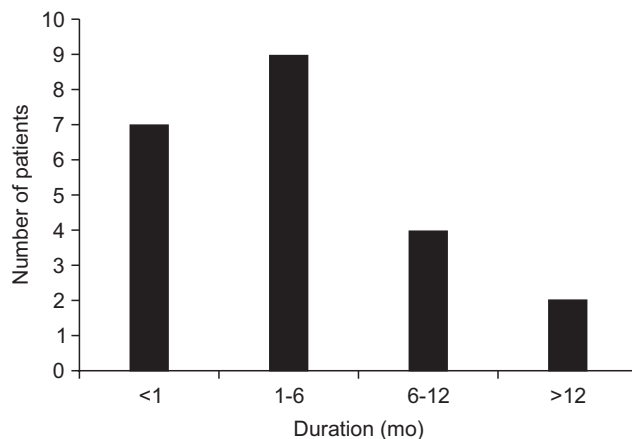


Fig. 2. Distribution of time duration from occurrence of trigeminal nerve damage to the first visit.

Table 3. Comparison of T-scores of SCL-90-R in the patients group divided by gender (n=22)

	Male	Female	p-value
SOM	45.00±7.47	47.94±7.98	0.339
O-C	39.49±4.62	46.95±12.88	0.274
I-S	41.02±6.79	48.01±12.72	0.274
DEP	40.39±4.67	45.99±10.22	0.193
ANX	44.62±6.11	43.75±8.85	0.244
HOS	44.27±8.08	46.36±10.14	0.631
PHO	42.69±4.09	49.76±15.02	0.779
PAR	42.26±8.34	48.56±14.83	0.836
PSY	42.09±4.19	46.66±11.45	0.630
GSI	41.01±4.93	46.89±12.05	0.306
PSDI	48.96±7.22	56.51±11.04	0.101
PST	57.88±5.86	69.65±12.40	0.014*

SCL-90-R, Symptom Checklist-90-Revised; SOM, somatization; O-C, obsessive-compulsive; I-S, interpersonal sensitivity; DEP, depression; ANX, anxiety; HOS, hostility; PHO, phobic anxiety; PAR, paranoid ideation; PSY, psychoticism; GSI, Global Severity Index; PSDI, positive symptom distress index; PST, positive symptom total.

Values are presented as mean±standard deviation.

*p<0.05 (by Mann-Whitney U test).

the symptoms occurred less than 6 months were designated the “acute group”. The “chronic group” was comprised of patients whose symptoms continued for more than 6 months. Compared to acute patients group, chronic patients group showed higher T-scores on respective all parameters, but the difference was not significant, except for the PST global index (Table 4).

DISCUSSION

An accurate assessment of nerve injury is essential for diagnosis, treatment plans, and possible medical disputes. In this study, the average T-scores of most of the SCL-90-R symptom dimensions were under 55 in both groups, except for PST index. These results showed that patients with iatrogenic damage of the trigeminal nerve did not have common pathological personality features. However, the average T-scores in the patient group were higher in all parameters, and there were items with significantly different scores. Scores for SOM, ANX, and PSY were significantly higher in the patient than in the control group (p<0.05). The significantly higher SOM score among the patients group might indicate that they strongly complained of physical dysfunction. SOM assesses physical symptoms in various body systems; including the cardiovascular, respiratory, and

Table 4. Comparison of T-scores of SCL-90-R in the patients group divided by symptom duration (n=22)

	Acute	Chronic	p-value
SOM	45.92±7.69	49.40±8.03	0.337
O-C	41.57±8.56	51.33±14.66	0.150
I-S	42.72±8.39	52.80±15.32	0.172
DEP	41.99±5.82	49.17±13.69	0.251
ANX	43.90±7.22	44.50±10.00	0.711
HOS	44.47±8.45	48.62±11.57	0.553
PHO	46.33±11.11	49.50±16.79	0.545
PAR	42.28±7.99	56.90±18.21	0.062
PSY	42.81±6.83	50.83±13.81	0.074
GSI	42.58±7.80	50.53±14.47	0.238
PSDI	51.64±10.62	59.45±7.51	0.090
PST	62.03±10.22	74.28±12.01	0.022*

SCL-90-R, Symptom Checklist-90-Revised; SOM, somatization; O-C, obsessive-compulsive; I-S, interpersonal sensitivity; DEP, depression; ANX, anxiety; HOS, hostility; PHO, phobic anxiety; PAR, paranoid ideation; PSY, psychoticism; GSI, Global Severity Index; PSDI, positive symptom distress index; PST, positive symptom total.

Values are presented as mean±standard deviation.

*p<0.05 (by Mann-Whitney U test).

digestive system, which are under the control of the autonomic nervous system; as well as physical dysfunction, such as headache and pain, and PSY indicates relatively broad symptoms related distant relationship to mental illness.²⁵⁾

Recent studies have shown that women have higher levels of postoperative pain than men.^{28,29)} In the comparison of the male and female patients groups, the average T-scores of the female group were higher than those of the male group, but the difference was not significant, except for the PST global index. PST provides an indication of a dramatising response style.³⁰⁾ Therefore, this gender difference might be interpreted as an attenuated behavior. In addition, we divided the patients group into 2 subgroups according to time since nerve injury had occurred. They were divided according to the duration after occurrence. Chronic pain is described as continuous pain over 6 months, and it is closely associated with behavioral factors or psychosocial factors.³¹⁾ Patients with chronic pain have different treatments and responses than those with acute patients. In this study, the chronic patients group had higher T-scores than the acute patients group, but the difference was not significant, except for the PST global index. In the chronic patients group, the T-score of the PST was higher than 65, even though GSI was less than 63.³²⁾ Therefore, it would be

interpreted that pain behavior could increase over time.

Although clinical and research interest has increased, neuropathic pain due to trigeminal injury has been poorly defined. In recent article, a diagnostic criterion for 'peripheral painful traumatic trigeminal neuropathy' was proposed.³³⁾ In this study, patients with iatrogenic damage of the trigeminal nerve were diagnosed based on them.

Neurologic lesions without pain can be recovered by surgical treatment,³⁴⁾ but the existence of a neuroma is a negative prognostic factor.^{35,36)} However, trigeminal nerve lesions with pain have uncertain prognoses with surgical treatment. It depends on the type of surgery performed, that is, nerve repair or interventional surgeries to further eliminate pathology. Tricyclic antidepressants (TCA) or gabapentin/pregabalin would be regarded as the first choice in systemic drug administration for painful peripheral neuropathy.^{37,38)} TCA and gabapentin can be replaced each other if they have no independent effect, or they can be used in combination.

Cognitive behavioral therapy (CBT) has been successfully used for treatment of chronic pain in patients when used alone or in an interdisciplinary pain-rehabilitation program.³⁹⁾ In this study, T-scores of most of the SCL-90-R symptom dimensions were less than 55 in both groups, except for the PST global index. However, in the comparisons of T-scores between the control and the patients group revealed that 3 parameters (SOM, ANX, PSY) and PSDI global index had statistically significant difference. Therefore, CBT or psychological consultation would be considered as another treatment options for patients with iatrogenic damage of the trigeminal nerve.

This study has several limitations. There was no psychological evaluation of patients before the trigeminal nerve damage. The sample size also needs to be increased because patients with weak symptoms or break appointment were excluded from the study. In addition, comparisons between the treatment-responsive and non-responsive group after long-term treatment will be required.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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