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Oral Health Related Quality of Life in Slovenian Patients with Craniomandibular Disorders

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A B S T R A C T

Sixty eight consecutive Slovenian patients with craniomandibular disorders (CMD) participated as the study group and another 400 adults from the regional population sample participated as the control group. The aim was to determine the impact of craniomandibular disorders to the self-perceived oral health related quality of life (OHRQoL) and to compare the OHRQoL with a control group. The mean Oral Health Impact Profile (OHIP) summary scores were computed for all patients with the same diagnosis and for the same subgroups of the axis I according to the RDC/TMD exam protocol. The mean OHIP subscores for the seven domains of the OHIP questionnaire were compared between the study and the control group. Significantly higher OHIP summary scores and all the OHIP subscores were obtained in the CMD patients in comparison with the control group ($p<0.05$). Furthermore, in the CMD group, patients with two related diagnoses had significantly higher impaired OHRQoL than patients with a single one. The results revealed: 1. The CMD subjects are highly associated with the reduced OHRQoL, 2. Higher number of diagnoses of the axis I according to the RDC/TMD results in the more impaired OHRQoL, 3. The higher age of the patients revealed the more impaired OHRQoL.

Key words: *craniomandibular disorders, quality of life, temporomandibular disorders, oral health impact profile, RDC/TMD, Slovenia*

Introduction

Craniomandibular disorders (CMD) include a group of clinical diagnoses that could be summarized as a myofascial pain of the muscles of the stomatognathic system, internal dearrangments of the temporomandibular joints, and degenerative and/or inflammatory temporomandibular joint disease. Patients suffering from CMD often have more than one diagnosis[1]. Usually the clinical signs comprise the orofacial pain, limited jaw opening and the joint sounds. The aetiology of the CMD is multifactorial. Oral parafunctions, especially bruxsism, trauma of the mandible or temporomandibular joints and emotional stress are known as etiological factors[1].

The CMD patients often co-suffer from different psychological and physical conditions as a consequence of their disease, especially a chronic orofacial pain[2]. Furthermore, different psychological conditions are known as possible risk factors for the development of CMD and they can also highly affect the final treatment outcome[2]. Every CMD patient experiences his/her condition in the unique way. Therefore, a standardized assessment of the self-perceived disorders of the stomatognathic system should be emphasized in clinical studies.

Various Oral Health Related Quality of Life (OHRQoL) indicators are based on a conceptual framework derived from the International Classification of Impairments, Disabilities and Handicaps (ICIDH) developed by WHO in 1980[2]. The ICIDH model consists of the following key concepts: impairments, functional limitations, pain, disability, and handicap. It provides a theoretical basis for the empirical exploration of the links between various dimensions of general and oral health. Locker subsequently introduced this theoretical framework in dentistry[3].

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The original Oral Health Impact Profile (OHIP) questionnaire consists of 49 items, representing seven domains (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap) which measure both the frequency and severity of oral problems[4]. For each question, the subjects are asked how frequently they had experienced the impact of the problem in the last month[5]. The OHIP questionnaire has been accepted worldwide and has been used for various longitudinal clinical and/or cross-cultural studies.

The aim of this study was to evaluate the impact of different diagnoses of the CMD according to the axis I of the International Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) exam protocol to the self-percieved OHRQoL and also to compare the OHRQoL of the CMD patients to the regional adult population sample.

Materials and Methods

Sample populations, together with age and gender are listed in Table 1. Treatment seeking adult patients with at least one physical (axis I) CMD diagnosis according to the RDC/TMD were included in this study. The OHRQoL was assessed using the oral health impact profile (OHIP-49) questionnaire. The OHIP summary score of the OHIP questionnaire was calculated. A regional population sample of 400 adults served as a control group.

All 68 CMD patients were seeking treatment for masticatory muscle and TMJ problems at the Department of Fixed Prosthodontics and Occlusion, University Medical Centre of Ljubljana, Slovenia in the period of the beginning of the 2006 until the beginning of the 2008. In this Department, the RDC/TMD protocol was introduced into the clinical management of the CMD patients in the year 2005. All the patients were professionally referred CMD patients. The majority of them were referred from the Department of the Maxillofacial and Oral Surgery, University Medical Centre of Ljubljana, Slovenia, after other diagnoses were excluded. All subjects were well-informed about the aim and the methods, and gave writen consent. The study was approved by the National Medical Ethics Committee of Slovenia.

The majority of patients had more than one diagnosis according to the RDC/TMD protocol. Only one diagnosis of the axis I was established in 23 patients (33.8%). The same percentage of the patients had two diagnoses and 22 (32.4%) patients had three or more diagnoses.

The control group comprised adults from the general population living in the metropolitan area of Ljubljana, Slovenia. The OHRQoL was calculated as the OHIP summary score of the Slovenian version of the OHIP questionnaire. This instrument had 49 items. Responses were made on a Lickert-type scale with the following possible responses: 0-never, 1-hardly ever, 2-occasionally, 3-fairly often, and 4-very often.

All the patients were physically examined using the RDC/TMD protocol[6]. Axis I diagnoses were established.

Reliability

In order to test the reliability of the measurements, 10 CMD patients were examined twice by the same dental practitioner within a two-week period. Statistical

TABLE 1
OVERVIEW OF THE SAMPLE POPULATIONS BY AGE AND GENDER

Sample	Sample type	n	Age mean (SD)	Age range	% women
Patients with a CMD[a]	Consecutive	68	36.54 (13.76)	18–65	85.3
General population[b]	Random	400	41.38 (12.66)	19–80	67.5

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TABLE 2
PHYSICAL DIAGNOSES (AXIS 1 MEASURES) ACCORDING TO THE RESEARCH DIAGNOSTIC CRITERIA FOR TEMPOROMANDIBULAR DISORDERS AND THE PERCENTAGE OF THE PATIENTS DEPENDENT ON THE EACH DIAGNOSE

Main groups	Diagnoses	%
I: Myofascial pain	Ia: Myofascial pain without limited opening	51.5
	Ib: Myofascial pain with limited opening	26.5
II: Disc displacement	IIa: Disc displacement with reduction	27.9
	IIb: Disc displacement without reduction, with limited opening	11.8
	IIc: Disc displacement without reduction, without limited opening	19.1
III: Arthralgia, osteoarthritis and osteoarthrosis	IIIa: Arthralgia	47.1
	IIIb: Osteoarthritis of the TMJ	14.7
	IIIc: Osteoarthrosis of the TMJ	5.9

analysis (paired t test) revealed no significant differences between the first and the second survey ($p>0.05$).

Data analysis

Statistical analysis was made using the statistical software package SPSS 14 for Windows XP, with the probability of a type I error set at the 0.01 level. Normality of the distribution was tested by the Kolmogorov-Smirnov test. Means, standard deviations and the 95 % confidence intervals were calculated. Significance of the differences between the OHIP summary scores of the study and the control group was assessed by the independent samples t-test. The Pearson's coefficients of correlation were also computed.

Results

The mean OHIP summary score of the 68 patients was 46.8 points, compared with 25.5 for the general population sample. The lowest OHIP score was observed for the temporomandibular disc displacement with reduction (37.3, diagnose IIa), which is often pain-free and only joint sounds may be reported or discovered during examination. The highest OHIP summary score (82.6) was calculated for the disc displacement without reduction, with limited opening (IIb diagnose). Female patients had mean OHIP summary score (48.6), which was not significantly different in comparison to the values of the male patients (36.6, $p=0.373$). A Pearson correlation coefficient was calculated for the OHIP summary score and the age of the patient group. Correlation test with $r=0.557$ was significant at the 0.01 level ($p<0.001$), with higher scores in patients with higher age.

All possible diagnoses of the axis I according to the RDC/TMD exam form are listed in the Table 2, together with a percentage of patients for each diagnose. The number and the percentage of patients with one, two, and three or more diagnoses of the axis I, are presented in the Table 3. Of the total of 68 CMD patients, 19 of them had 3 diagnoses, two had 4 diagnoses and only one patient had a maximum of 5 diagnoses.

Mean OHIP subscores for the CMD patients and for the general population were calculated and the p-values for the statistical significance are displayed in the Table 4. The CMD patients with all RDC/TMD axis I diagnoses presented considerably lower OHRQoL in comparison to the general population sample (Table 4).

The mean OHIP scores of the patients for each particular diagnose of the axis I are graphically presented in the Figure 1, together with a 95 % confidence interval. Mean OHIP scores of the patients for each subgroup (miofascial pain, disc displacement, inflammatory and degenerative diseases of the temporomandibular joint) of the axis I are graphically displayed in the Figure 2.

TABLE 3
NUMBER AND PERCENTAGE OF PATIENTS WITH 1, 2, AND THREE OR MORE DIAGNOSES

No. of axis I diagnoses	No. (%) of patients	Mean OHIP summary score
1	23 (33.8 %)	24.2
2	23 (33.8 %)	46.5
3 or more	22 (32.4 %)	70.7

Discussion

The impact of the CMD to the self-percieved OHRQoL has been the object of interest in only few earlier studies[7–10]. To our best knowledge, the first study on this field was performed at the University of Pavia in Italy, where 124 consecutive patients and the 61 »pain free« controls were compared[7]. The results of that study revealed that orofacial pain negatively affected the quality of life of the patients with temporomandibular disorders. The same research group also published a specialized version of the OHIP instrument with 30 items for the TMD patients[8]. In the two German studies from the year 2007 accomplished at the University of Leipzig, the OHRQoL was markedly impaired in 416 consecutive patients with TMD in comparison to the 135 individuals without any RDC/TMD axis I diagnosis[9,10]. In the present study, a much larger control group than the experimental

TABLE 4
COMPARISON BETWEEN MEAN OHIP SCORES OF CASES AND CONTROLS

	No. of items	Maximal theoretical OHIP summary subscore	Mean score for cases	Mean score for controls	p-value
n			68	400	
Functional limitation	9	36	10.44	7.53	0.003
Physical pain	9	36	10.78	6.97	0.001
Psychological discomfort	5	20	5.79	3.67	0.003
Physical disability	9	36	5.99	2.93	0.002
Psychological disability	6	24	3.81	1.92	0.007
Social disability	5	20	1.93	0.82	0.034
Handicap	6	24	3.32	1.67	0.017
OHIP summary score	49	196	46.80	25.5	0.001

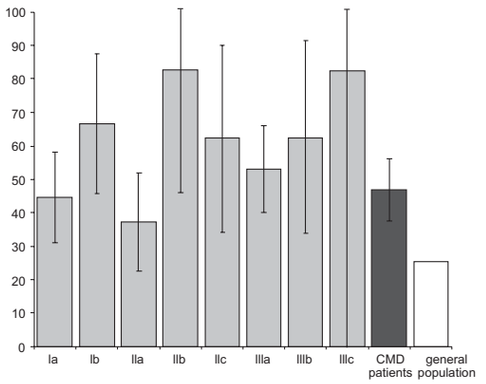

Fig. 1. Mean OHIP summary scores for each axis I diagnoses is displayed, together with a 95% confidence intervals. Mean OHIP summary scores for the CMD patient group and for the general population is also added.

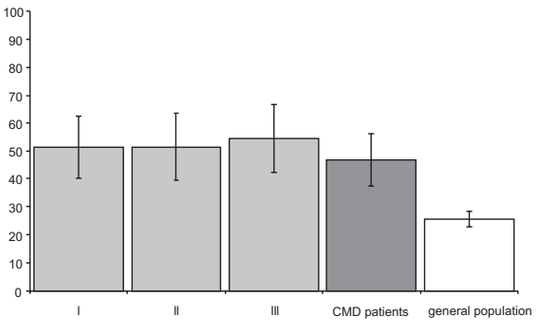

Fig. 2. Mean OHIP summary scores for each axis I subgroup is displayed, together with a 95% confidence intervals. Mean OHIP summary scores for the CMD patient group and for the general population is also added for comparison.

group was used for statistical comparison. This strategy increases the probability that the control group will provide an accurate framework for statistical comparison and also increases statistical precision[11].

In the present study, the mean age of the CMD patients was 36.5 years, which was almost the same as in the Italian (35.1 years), and German study (38.5 years). This confirms the previous findings where it was established that CMD affects predominantly females in the years of fertility [1].

Mean OHIP summary scores were compared to the general population sample for all the diagnoses of the axis I and were significantly higher in the CMD patients (Figure 1). These results are similar to the report of the German study[9,10]. Furthermore, patients with two diagnoses had significantly higher values than patients with a single diagnose (Table 3). Patients with three or more diagnoses had similarly higher impaired OHRQoL than patients with a lower number of diagnoses. These results are also in accordance with a German study[10]. This phenomenon could indicate that the impairment of different anatomical structures of the stomatognathic system results as a summarizing effect.

Those diagnoses of the axis I that are clinicaly demonstrated with pain and limited movement of the lower jaw, have especially high impact to the psychological discomfort[12]. These assumptions were comfirmed with the results of the present study. The miofascial pain, together with a restricted mouth opening (diagnose Ib), disc displacement without reduction, together with a restricted opening (diagnose IIb), and osteoarthrosis (diagnose IIIc) resulted with the highest mean values of the OHIP summary scores (Figure 1).

A major strenght of this study is the application of the standardized OHIP questionnaire and also the standardized assesment of the level of impairment of different anatomical structures that constitute a stomatognathic system according to the RDC/TMD protocol. Limitation of this study is nevertheless, the small number of patients for some specific diagnoses of the axis I, for example the osteoarthrosis of the temporomandibular joint (TMJ) (diagnose IIIc), which was confirmed in only 4 patients. Moreover, a clinical examination according to the RDC/TMD protocol was not performed in the control group of the general population.

The results of the present study, made under standardized protocol, enable the comparison of the OHRQoL of the CMD patients with CMD patients of other nationalities, socioeconomic or ethnic groups. In future, multicentre studies should be performed, because of the possible different experience of the self-perceived OHRQoL in CMD patients from different nationalities and cultures worldwide. This is nowadays realizable with a standardized assessment of the OHRQoL using the OHIP questionnaire, which has already been translated to more than 10 languages worldwide, together with the evaluation of the psychometric properties[24].

Conclusions

The CMD patients had more impaired OHRQoL in comparison with the control group, presented by significantly higher OHIP summary scores and all seven subscores ($P<0.05$). The obtained relationships of different diagnoses of the axis I, according to the RDC/TMD protocol, and the OHIP summary scores may be helpful in a deeper understanding of the complex association between CMD and the psychical experience of the individuals. Therefore, the results of the present study, made under standardized protocol, enable the comparison of the OHRQoL of the CMD patients with other nationalities or ethnic groups.

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KVALITETA ŽIVOTA OVISNA O ORALNOM ZDRAVLJU KOD PACIJENATA SA KRANIOMANDIBULARNIM POREMEĆAJIMA U SLOVENIJI

SAŽETAK

U istraživanju provedenom u slovenskoj populaciji sudjelovalo je šezdeset osam pacijenata sa kraniomandibularnim poremećajima (CMD) i 400 odraslih ispitanika iz regionalne populacije (kontrolna skupina). Svrha rada bila je odrediti utjecaj kraniomandibularnih poremećaja na samoprocijenjenu kvalitetu života ovisnu o oralnom zdravlju (OHRQoL). Svrha je bila također usporediti OHRQoL između CMD pacijenata i kontrolne skupine. Izračunati su zbrojevi rezultata »Oral Health Impact Profil« – upitnika (OHIP) za pacijente sa istim dijagnozama, koji pripadaju istim podgrupama prema osi I RDC/TMD protokola za CMD pacijente. Dobivene su statistički značajno veće vrijednosti za OHIP sumarni rezultat, kao i za svih 7 podgrupa kod pacijenata sa CMD u odnosu na kontrolnu skupinu ($p<0.05$). Nadalje, u CMD skupini, pacijenti sa dvije povezane dijagnoze imali su značajno veće OHIP rezultate od pacijenata sa samo jednom dijagnozom. Rezultati ovog istraživanja pokazuju: 1. CMD pacijenti imaju smanjenu OHRQoL, 2. Više dijagnoza prema osi I RDC/TMD protokola rezultira u lošijoj OHRQoL, 3. Stariji CMD pacijenti imaju slabiju OHRQoL.