Prevalence of Various Orofacial Pain Symptoms and Their Overall Impact on Quality of Life in a Tertiary Care Hospital in India

Sukhvinder Singh Oberoi · S. S. Hiremath ·
R. Yashoda · Charumohan Marya ·
Amit Rekhi

Received: 6 July 2013 / Accepted: 22 August 2013 / Published online: 14 September 2013
© Association of Oral and Maxillofacial Surgeons of India 2013

Abstract

Background Pain is a major public health problem and is the most commonly reported symptom of oral and dental disease that has a significant impact on both individual and community. The present study was prevalence of various orofacial pain symptoms and their overall impact on the quality of life in a tertiary care hospital.

Materials and Methods This study was carried out in the outpatient department of the Government Dental College and Research Institute, Bangalore. The severity of the chronic orofacial pain symptoms was assessed using the Chronic Pain Grade Questionnaire by Von Korff.

Results The results showed that toothache (57.6 %) was the most commonly reported symptom and burning mouth sensation (6.4 %) was the least commonly reported. Majority of the patients had grade 3 level of pain-related disability (34.8 %) followed by grade 2 (26.8 %), grade 1 (22.4 %) and grade 4 levels (16 %). The mean pain intensity was reported to be more among females and maximum among patients with facial pain.

Conclusion The present study demonstrated that orofacial pain symptoms have a significant impact on the patients suffering from it. Therefore, proper measures should be taken for the management of the patients with these symptoms and associated conditions.

Keywords Chronic Pain Grade Questionnaire · Pain-related disability · Pain intensity · Orofacial pain symptom

S. S. Oberoi (✉) · C. Marya · A. Rekhi
Public Health Dentistry, Pt. B.D. Sharma University, Rohtak,
India
e-mail: drsukhvinder@gmail.com

C. Marya
e-mail: maryacm@yahoo.co.uk

A. Rekhi
e-mail: rekhiamit@gmail.com

S. S. Oberoi · C. Marya · A. Rekhi
Public Health Dentistry, Sudha Rustagi College of Dental
Sciences and Research, Kheri More, Faridabad, Haryana, India

S. S. Hiremath
Public Health Dentistry, Oxford College of Dental Sciences and
Research, Rajiv Gandhi University of Health Sciences,
Bangalore, India
e-mail: hiremath29@gmail.com

R. Yashoda
Public Health Dentistry, Government Dental College and
Research Institute, Rajiv Gandhi University of Health Sciences,
Bangalore, India
e-mail: docyashpcd@gmail.com

Introduction

Psychological stress is implicated in the onset and progression of several chronic conditions in which pain is the major symptom [1]. Pain is a subjective and complex phenomenon with significant discomfort, suffering and is the most common symptom of dental and oral diseases. It is a major public health problem that can have significant and profound impact on the quality of everyday life and is one of the greatest reasons for the utilization of the dental health care services [2, 3].

Pain sensation from the intraoral and extraoral structures of the head and face are carried to the Central Nervous System (CNS) by the trigeminal system [4]. Orofacial pain can be defined as pain related to the face or mouth region. The National Center for Health Statistics generally uses a

cutoff point of 3 months to distinguish between acute and chronic pain. Orofacial pain consists of pain of 2 regions: facial and oral pain. Facial pain includes the pains whose origin is below the canthometal line, above the neck and anterior to the ears, while the oral pain indicates the pain originating from structures within the mouth [5].

Many of these regional pains present a recurrent, persistent, or disabling pattern because of the complex regional anatomy of the face and the mouth region, and difficulties in the diagnosis and treatment of chronic pain conditions. The facial region has special characteristics with biological, emotional, and psychological meaning to the person. Orofacial pain (OFP) has impact on individual and frequently results in attendance either to primary (dental or medical) care and onward referral to specialist services [5–7].

Oral and dental pain can have social, psychological and economic consequences on individuals and communities [8]. Untreated chronic pain can lead to increased disability, increased risk of fall, depression, sleep deprivation, reduced quality of life and social isolation. Orofacial pain symptoms were associated with significant disability and had a detrimental impact on psychological distress level and quality of life [9, 10].

Subjective reports of the pain intensity have been used as an important tool for measuring the extent of pain [11, 12]. However, the pain intensity alone may not accurately evaluate the severity of pain. When the symptoms of pain persist, limitations on social or daily living should be considered for discriminating the higher levels of severity of chronic pain conditions [13, 14]. The conditions involving chronic orofacial pain represent a major health problem, and patients with persistent pain are difficult to manage successfully [15].

Hence, the present study was carried out to evaluate the prevalence of various orofacial pain symptoms and their overall impact on quality of life and suggest appropriate preventive measures for the patients reporting with orofacial pain symptoms.

Materials and Methods

The present study was a cross-sectional single center based study carried out in the outpatient department of Government Dental College and Research Institute, Bangalore.

Pilot Study

A pilot survey was undertaken to calculate the sample size, feasibility of the study and finalize the proforma. Based on the results of the pilot study, the sample size was decided to be 500 patients.

The patients with orofacial pain symptoms (tooth pain, face pain, temporomandibular joint (TMJ) pain, burning mouth pain, and oral sores) for more than 3 months were included in the study.

Ethical Clearance

Before conducting the study, the required permission to carry out the study was taken from Dean cum Director of Government Dental College & Research Institute, Bangalore. Informed consent to carry out the study was obtained from the participants of the study.

Examination and Collection of Data

A standardized structured proforma was used for the collection of the data which consisted of two parts. The first part included general information like patient's age, sex, religion, medical history and dental history including chief complaint, and location of pain.

The second part of the proforma consisted of Chronic Pain Grade Questionnaire by Von Korff et al. [8] which consisted of 7 questions. The first 3 questions were used for assessing the pain intensity for the patient; the fourth question was used for measuring the disability days and the last 3 questions for assessing the disability points. Each patient with orofacial pain was asked to give grades from 1 to 10 for each question.

Inclusion Criteria

1. Adult patients in the age group of 30–65 years.
2. Patients with orofacial pain symptoms persisting for more than 3 months.
3. Patients in whom informed consent could be obtained.

Exclusion Criteria

1. The patients unable to co-operate due to severe pain.
2. The patients with idiopathic pain in whom a definite cause of pain could not be established.

Scoring of Chronic Pain Grade

For each question, the patients were supposed to read the question and mark a response between 0 and 10.

Pain Intensity A 0–100 score derived from questions 1–3, is calculated as follows:

Mean (Question 1 + Question 2 + Question 3) $\times$ 10

Disability score A 0–100 score derived from questions 5–7, is calculated as follows: Mean (Question 5 +

Question 6 + Question 7) $\times 10$ and it was recoded as given below in the table.

Disability points A 0–6 score derived from the disability score recoded plus disability days (Question 4) recoded.

Parameter	Finding	Points
Disability days from question no. 4	0–6 days	0
	7–14 days	1
	15–30 days	2
	≥ 31 days	3
Disability score from questions 5–7	0–29	0
	30–49	1
	50–69	2
	70+	3

The pain intensity scores ranged from 0 to 100 and the disability points ranged from 0 to 6.

The findings were summarized as follows:

Findings	Type	Grade
No pain problems	Pain free	0
Characteristic pain intensity <50, disability points <3	Low disability, low intensity	I
Characteristic pain intensity ≥ 50 , disability points <3	Low disability, high intensity	II
Disability points 3 or 4	High disability, moderately limiting	III
Disability points 5 or 6	High disability, severely limiting	IV

The VAS scale with 0 for no pain and 100 for pain as bad as it could be was used for calculating the impact on the daily, social and work activities from Questions 5, 6 and 7 respectively.

Statistical Analysis

The data collected was analyzed using the Statistical Package for Social Sciences (SPSS version 16.0) and Epi-info version 6.0. The chi square test was used to compare orofacial pain symptoms and chronic pain grade score among males and females and patients with different orofacial pain symptoms. The analysis of variance (ANOVA) test was used for comparison of mean pain intensity among patients with different orofacial pain symptoms. The significance for all statistical tests was predetermined at a probability value of 0.05 or less.

Results

The demographic profile of the study population is shown in Table 1. The study was carried out among adult population.

Distribution of Orofacial Pain Symptoms

The prevalence of the orofacial pain symptoms was found to be 42.7 % among the patients reporting to OPD of the hospital. Tooth pain (toothache) was the most commonly reported symptom (57.6 %) whereas burning mouth (6.4 %) was the least commonly reported symptom (Table 2).

Gender difference was seen for the distribution of the orofacial pain symptoms though it was not statistically significant (p -value = 0.431). Face pain and painful oral sores had higher prevalence for females (8 and 4.8 % respectively) in comparison to males (5.2 and 3.2 % respectively) whereas pain related to the TMJ region and toothache had higher prevalence among males (8.4 and 31.2 %) in comparison to the females (6.4 and 26.4 %). (Table 2).

Pain Intensity

Females (69.0 ± 23.8) demonstrated higher mean pain intensity as compared to males (66.1 ± 22.5). The mean pain intensity was found to be significantly more among

Table 1 Distribution of the patients with orofacial pain according to age groups and gender

Age groups (years)	Gender		Total (%)
	Male (%)	Female (%)	
30–39	100 (39.1)	102 (41.8)	202 (40.4)
40–49	62 (24.2)	52 (21.3)	114 (22.8)
50–59	50 (19.5)	40 (6.4)	90 (18)
60–64	44 (17.2)	50 (20.5)	94 (18.8)
Total	256 (100)	244 (100)	500 (100)
Location	Male	Female	Total
Rural	112 (43.75)	112 (45.9)	206 (41.2)
Urban	144 (56.25)	132 (54.1)	294 (49.8)
Total	256 (100)	244 (100)	500 (100)

Table 2 Gender distribution of the orofacial pain symptoms

Orofacial pain symptom	Male (%)	Female (%)	Total (%)
TMJ pain	42 (8.4)	32 (6.4)	74 (14.8)
Facial pain	26 (5.2)	40 (8)	66 (13.2)
Toothache	156 (31.2)	132 (26.4)	288 (57.6)
Oral sores	16 (3.2)	24 (4.8)	40 (8)
Burning mouth sensation	16 (3.2)	16 (3.2)	32 (6.4)
Total	256 (51.2)	244 (48.8)	500 (100)

Chi square = 3.82, p -value = 0.431

the patients with face pain (72.8 ± 21.6) and least among the patients with tooth pain (63.1 ± 24.3).

The mean pain intensity scores did not have a significant difference (p -value = 0.154) among the patients with orofacial pain symptoms. The mean pain intensity scores were found to be more among patients with facial pain (72.8 ± 21.6) and burning mouth (70.7 ± 16.3) and least among patients with tooth pain (63.1 ± 24.3) (Table 3).

Chronic Pain Grade Scores

Chronic pain grade 2 (high disability, moderately limiting) (26.8 %) and grade 3 (low disability, high intensity) (34.8 %) scores were mostly recorded among patients reporting with orofacial pain symptoms. The chronic pain grade scores 2 and 4 were found more frequently among females (15.2 and 10 % respectively) whereas grade 1 and 3 scores were found more frequently among males (15.2 and 18.4 %). There was a statistically significant difference with respect to the chronic pain grade scores p -value (= 0.012) among males and females (Table 4).

The chronic pain grade score 1 was more among the patients with facial pain (33.3 %), TMJ pain (21.6 %) and oral sores (15 %) whereas grade 2 level of pain was more among the patients with toothache (36.1 %) and TMJ pain (35.2 %). Chronic pain grade score 3 was more among the patients with toothache (29.9 %), oral sores (25 %), TMJ pain (21.6 %), facial pain (21.2 %), and burning mouth sensation though the difference was not statistically significant (p -value = 0.103) (Table 5).

Table 3 Comparison of pain intensity among the patients with orofacial pain symptoms

Location of pain	Mean pain intensity	p -value
TMJ pain	68.8 ± 17.2	0.154
Facial pain	72.8 ± 21.6	
Tooth pain	63.1 ± 24.3	
Oral sores	64.7 ± 22.8	
Burning mouth	70.7 ± 16.3	

Table 4 Gender distribution of the chronic pain grade scores

Chronic pain grade	Gender		Total (%)
	Male (%)	Female (%)	
Grade 1	76 (15.2)	36 (7.2)	112 (22.4)
Grade 2	58 (11.6)	76 (15.2)	134 (26.8)
Grade 3	92 (18.4)	82 (16.4)	174 (34.8)
Grade 4	30 (6)	50 (10)	80 (16)
Total	256 (51.2)	244 (48.8)	500 (100)

Chi square = 11.002, p -value = 0.012

The orofacial pain symptoms had significant impact on the various lifestyle activities. There was a severe impact on the daily activities (48.4 %), social activities (44.4 %) and work activities (38.4 %) of the patients (Table 6).

Discussion

The prevalence of orofacial pain symptoms was found to be 42.7 % in the present study among the patients reporting to the OPD of the Government Dental college which was found to be similar to the study done by Chung et al. [4] (42 %), Allen et al. [16] (41.6 %) and Locker and Grushka [17] (39.7 %) but the prevalence of orofacial pain symptoms was reported to be lower in the study by Riley et al. [18] (17.4 %), Macfarlane et al. [7] (26 %) and Aggarwal et al. [19] (26 %). The higher prevalence in the present study might be related to the reduced dental awareness and reduced access to dental care among the Indian population because of the socio-cultural differences between the study population and the other populations used for comparison.

The distribution of the orofacial pain symptoms in the present study showed that toothache (57.6 %) was the most common symptom followed by TMJ pain (14.8 %), face pain (13.2 %), oral sores (8 %) and burning mouth (6.4 %). This was quite similar to the study by Chung et al. [4] [Joint pain (15.5 %), face pain (9.3 %), toothache (26.8 %), oral sores (26.2 %), and burning mouth (14.2 %)]. Another study conducted by Riley et al. [18] also demonstrated similar findings [Jaw joint pain (7.7 %); face pain (6.9 %); oral sores (6.4 %); toothache (12 %); burning mouth (1.7 %)] in which, tooth pain was the most prevalent symptom. This was also similar to the study conducted by Wan et al. [10] in which toothache was the most commonly reported symptom (62.0 %) and burning sensation in the tongue was least common (0.5 %).

In the present study, higher mean pain intensity scores were found in the patients with face pain (72.81 ± 21.55), TMJ pain (68.79 ± 17.23) and burning mouth sensation (70.67 ± 16.33) in comparison to the patients with tooth pain (63.09 ± 24.29) and oral sores (64.67 ± 22.85). This was similar to the study done by Chung et al. [4] where subjects with joint pain, face pain, toothache, or burning mouth reported significantly higher level of pain intensity than those without these symptoms. The relatively high percentage of high disability in our study could come from any of the several reasons: the Indian population may express their emotional distress or disability more easily [4].

Grade 2 and grade 3 level of chronic pain was reported with all the orofacial pain symptoms. High disability (grades 3 and 4 level of pain) was reported for patients with temporomandibular joint pain, burning mouth, and face

Table 5 Chronic pain grade level among the patients with different orofacial pain symptoms

Chronic pain grade	TMJ pain (%)	Facial pain (%)	Tooth pain (%)	Oral sores (%)	Burning mouth (%)	Total (%)
Grade 1	16 (21.6)	22 (33.3)	26 (9.0)	6 (15)	10 (31.25)	80 (16)
Grade 2	26 (35.2)	22 (33.3)	104 (36.1)	12 (30)	10 (31.25)	134 (26.8)
Grade 3	16 (21.6)	14 (21.2)	86 (29.9)	10 (25)	8 (25.00)	174 (34.8)
Grade 4	16 (21.6)	8 (12.2)	72 (25.0)	12 (30)	4 (12.50)	112 (22.4)
Total	74 (100)	66 (100)	288 (100)	40 (100)	32 (100)	500 (100)

Chi square value = 18.4, *p*-value = 0.103

Table 6 Impact of orofacial pain symptoms on daily, work and social activities

Degree of impact	Daily activities	Social activities	Work activities
No	18 (3.6)	36 (7.2)	50 (10.0)
Mild	102 (20.4)	84 (16.8)	70 (14.0)
Moderate	138 (27.6)	158 (31.6)	188 (37.6)
Severe	242 (48.4)	222 (44.4)	192 (38.4)
Total	500 (100)	500 (100)	500 (100)

The value in the parenthesis indicates percentage

pain. This was similar to the study of Chung et al. [4] [symptoms of joint pain, burning mouth, and toothache pain were associated with high levels of disability (grades 3 and 4)].

Gender differences in pain intensity were not significant which was similar to the study of Chung et al. [4] (43.4 ± 22.7 among males and 47.4 ± 23 among females) but concur with the lack of gender differences in the pain ratings reported in a sample of an elderly population in the study of Riley et al. [20]. This might be related to the dental services being used at an earlier stage of dental problem among women as compared to men among the Indian population.

Conclusion

Orofacial pain causes a significant impact on the person leading to disability and discomfort. Orofacial pain derives from a vast number of complex etiologies and warrants aggressive and appropriate treatment in a multidisciplinary setting. Every effort should be made to emphasize the importance of early intervention in oral health to avoid suffering from orofacial pain in the future.

Orofacial pain derives from a vast number of complex etiologies and its successful treatment requires contributions from many different specialties. It is one of the most distressing symptoms and warrants aggressive and

appropriate treatment in a multidisciplinary setting. Every effort should be made to emphasize the importance of early intervention in oral health to avoid suffering from orofacial pain in the future.

Burning mouth pain and oral sores are primarily related to the nutritional deficiency of the vitamins. So, it can be managed through good nutritional regime or balanced diet containing all the nutrients in the appropriate amount.

However, there were certain limitations in the study that should be mentioned. First, the cross-sectional study design cannot infer the causative effect of the variables strongly. Future investigations might consider a longitudinal design. Secondly, the study data was collected from a single hospital representing a study population with a similar socioeconomic status. So, selection bias might have occurred.

Further research is recommended to provide a comprehensive assessment of chronic orofacial pain in the community, including its epidemiology, natural history, and impact from a patient, professional and economic perspective.

Acknowledgments I would like to thank my guide Dr. Yashoda R., for her valuable support and guidance. I would also like to thank my Head of the Department and Dean cum Director, Dr. S. S. Hiremath for his kind support and guidance. I would also acknowledge the help of Mr. Tejasvi for the statistical support.

References

1. Sanders AE, Slade GD (2011) Gender modifies effect of perceived stress on orofacial pain symptoms: National survey of adult oral health. *J Orofac Pain* 25:317–326
2. Okeson JP (1995) Bell's orofacial pain, 5th edn. Quintessence Publications, Chicago
3. American Academy of Orofacial Pain (1997) The scope of TMD/ orofacial pain (head and neck pain management) in contemporary dental practice. Dental Practice Act Committee of the American Academy of Orofacial Pain. *J Orofac Pain* 11:78–83
4. Chung JW, Kim JH, Kim HD, Kho HS, Kim YK, Chung SC (2004) Chronic orofacial pain among Korean elders: prevalence, and impact using the graded chronic pain scale. *Pain* 112:164–170
5. Macfarlane TV, Blinkhorn AS, Davies RM, Kinney J, Worthington HV (2002) Orofacial pain in the community: prevalence and associated impact. *Community Dent Oral Epidemiol* 30:52–60

6. Von Korff M, Ormel J, Keefe FJ, Dworkin SF (1992) Grading the severity of chronic pain. *Pain* 50:133–149
7. McFarlane TV, Glenny AM, Worthington HV (2001) Systematic review of population based studies of orofacial pain. *J Dent* 29:451–467
8. Wong MCM, McMillan AS, Zheng J, Lam CLK (2008) The consequences of orofacial pain symptoms: a population based study in Hong Kong. *Community Dent Oral Epidemiol* 36:417–424
9. Cornally N, McCarthy G (2011) Help-seeking behaviour for the treatment of chronic pain. *Br J Community Nurs* 16:90–98
10. Wan KY, McMillan AS, Wong MC (2012) Orofacial pain symptoms and associated disability and psychosocial impact in community-dwelling and institutionalized elderly in Hong Kong. *Community Dent Health* 29:110–116
11. Ho K, Spence J, Murphy MF (1996) Review of pain-measurement tools. *Ann Emerg Med* 27:427–432
12. Huskisson EC (1974) Measurement of pain. *Lancet* 2:1127–1131
13. Murray H, Locker D, Mock D, Tenenbaum HC (1996) Pain and the quality of life in patients referred to a craniofacial unit. *J Orofac Pain* 10:316–323
14. Von Korff M, Dworkin SF, Le Resche L (1990) Graded chronic pain status: an epidemiologic evaluation. *Pain* 40:279–291
15. Rodrigues PC, Pertes RA, Heir GM, Nasri C, Harold V, de Araújo CRP (2003) Orofacial pain: basic mechanisms and implication for successful management. *J Appl Oral Sci* 11:1–7
16. Allen PF, McMillan AS, Walshaw D, Locker D (1999) A comparison of the validity of generic and disease-specific measures in the assessment of oral health-related quality of life. *Community Dent Oral Epidemiol* 27:344–352
17. Locker D, Grushka M (1987) Prevalence of oral and facial pain and discomfort: preliminary results of a mail survey. *Community Dent Oral Epidemiol* 15:169–172
18. Riley JL, Wade JB, Myers CD, Sheffield D, Papas RK, Price DD (2002) Racial/ethnic differences in the experience of chronic pain. *Pain* 100:291–298
19. Aggarwal VR, Macfarlane TV, Macfarlane GJ (2003) Why is pain more common amongst people living in areas of low socioeconomic status? A population-based cross-sectional study. *Br Dent J* 194:383–387
20. Riley JL, Gilbert GH, Heft MW (1998) Orofacial pain symptom prevalence: selective sex differences in the elderly? *Pain* 76:97–104