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Pain description and severity of chronic orofacial pain conditions

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Abstract

A multidisciplinary pain centre study of 120 consecutive chronic orofacial pain patients assessed pain description and intensity ratings, gender differences, prevalence of concurrent conditions, and interinstrument relationships of the McGill Pain Questionnaire and visual analogue scale. Pain words chosen by patients to describe conditions were predominantly sensory words, and patients with concurrent conditions often listed words indicating a substantial affective component. Results showed pain intensity ratings of chronic orofacial pain conditions have similar or higher pain ratings when compared with other medical chronic pain conditions such as back pain, cancer pain and arthritis. There was a significantly higher female: male ratio (88:32) with gender playing an important but poorly understood causal role. The most frequent condition diagnosed was atypical facial pain (n=40), followed by temporomandibular disorder (n=32), atypical odontalgia (n=29) and pathology of the orofacial region (n=19). Temporomandibular disorder was present in 75 of the 120 subjects, as the sole pain complaint (n=32) or as an associated secondary condition (n=43), indicating concurrent pain conditions exist and may be related. There were significantly higher total pain scores of the McGill Pain Questionnaire in patients with multiple conditions compared with patients with a single condition. The visual analogue scale showed a significant correlation to the number of words chosen index of the McGill Pain Questionnaire for orofacial pain.

Key words: Chronic orofacial pain, McGill Pain Questionnaire, visual analogue scale.

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Introduction

The term 'pain' is currently defined as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage' by the International Association for the Study of Pain (IASP) (Table 1).[1] Chronic pain is considered to be pain present for longer than six months and pain intensity may be influenced by nociception, environmental and psychological factors. The prevalence, severity and potential cost of chronic pain (including orofacial pain) in society are recognized as being immense. For example, the incidence of recurring orofacial pain in the USA (not including 'toothache') has been reported to be six per cent of the population, and pain in this region is deemed 'severe' by Australian medical authorities. Chronic pain has been termed the 'hidden epidemic' and the proposed economic costs of severe pain, including lost productivity, welfare payments and compensation, are potentially the highest for any health problem, costing Australia an estimated $30 billion per annum.[2]

The dental practitioner, unfortunately, is faced with several chronic pain conditions of the orofacial region which have been poorly described and investigated. Often, afflicted patients have an extensive history of investigations and procedures, suggesting that a diagnosis is difficult for the dental surgeon. Several factors can contribute to orofacial pain, in particular the complex regional anatomy of the head and neck region, involving sensory nerve distribution, local musculature (muscles of mastication, muscles of facial expression, neck muscles), salivary gland dysfunction, and the intricate mechanics and enervation of the temporomandibular joint. Physiological pain is a highly complex system involving interrelated biochemical and neurophysiological events. Adding to the difficulty of diagnosing a pain condition is the potential of neuropathic pain

Table 1. Glossary of pain terms[1]

AFP	Atypical facial pain
AFP-TMD	Atypical facial pain with secondary temporomandibular disorder
Allodynia	Pain from stimulus that does not usually cause pain
AO	Atypical odontalgia
AO-TMD	Atypical odontalgia with secondary temporomandibular disorder
CRPS	Complex regional pain syndrome
Hyperalgesia	Increased response to a painful stimuli
IASP	International Association for the Study of Pain
MPQ	McGill Pain Questionnaire
Neuropathic	Nerve pathology (nerve sprouting, demyelination)
NWC	Number of words chosen
Path	Pathology group
PRI(A)	Pain rating index (affective)
PRI(E)	Pain rating index (evaluative)
PRI(M)	Pain rating index (miscellaneous)
PRI(S)	Pain rating index (sensory)
PRI(T)	Pain rating index (total)
SD	Standard deviation
TMD	Temporomandibular disorder
TN	Trigeminal neuralgia
VAS	Visual analogue scale

developing in the oral cavity with associated hyperalgesia, allodynia and possible contributions from the sympathetic nervous system.[3] While specific pharmacological tests are available to assess components of chronic pain, often these tests are required to be carried out in specialist pain centres. However, description of a pain condition and the patients' reported pain intensity can provide valuable information for diagnosis and consequently alert the general dental practitioner as to when referral is appropriate. There are two relatively simple, patient self-report, pencil and paper instruments which are available for dentists to utilize in a clinical setting: the McGill Pain Questionnaire (MPQ) and the visual analogue scale (VAS).

The MPQ contains 78 words (pain descriptors) which can assess sensory and affective pain qualities. The MPQ has been used for evaluating acute, post-operative, orofacial pain from third molar teeth removal and has differentiated stages of dental pulpitis (irreversible versus reversible), with a correct prediction rate of 73 per cent in subjects.[4] Similar findings have been reported in using the MPQ to differentiate dental pulpitis from pericoronitis. Only one study, however, has used the MPQ for analysing chronic orofacial pain conditions, with the instrument correctly predicting the diagnosis in 90 per cent of patients with atypical facial pain (AFP) or trigeminal neuralgia (TN).[5]

The VAS assesses pain intensity and has been shown to have reliability, validity and versatility, although several variations exist.[6] An evaluation of various length and end-phrase variations of visual analogue scales showed that the 10 cm VAS had the smallest measurement error, while the end-phrase 'worst pain imaginable' had the greatest sensitivity in measuring 'present pain' for acute dental pain.[7] The VAS is useful for both chronic and experimental pain.

There were several aims to this study investigating chronic orofacial pain patients. Firstly, to analyse general data and pain variables for any significant links between gender, age, duration of pain, temporal quality of pain, and pain intensity from diagnosed conditions. Secondly, to establish if any significant relationships exist between MPQ and VAS instruments in chronic orofacial pain assessment. Thirdly, to examine the frequency of single versus multiple concurrent pain conditions encountered in this study.

Methods

The study assessed 120 consecutive patients with chronic orofacial pain, referred to a multidisciplinary pain centre, the Pain Management and Research Centre, The University of Sydney (the investigators' institution). The diagnosis of each patient's pain condition was made by the investigators (ERV, oral surgeon; MJC, anaesthetist/pain specialist) in collaboration with other pain centre personnel (psychologist, psychiatrist, rheumatologist and physiotherapist). The diagnoses were based on classification criteria specified by the IASP.[1] For this study, several well-defined pathological conditions (TN, osteoarthritis) were included in the one pathology group (Path) for the purposes of statistical analyses. All patients completed a comprehensive questionnaire that included age, sex, pain duration and temporal qualities of pain (constant, periodic, transient). Patients usually completed the questionnaire at home prior to their first appointment to allow ample time for completion. Patients were advised that interpreter services were available if needed, although no patient requested this form of assistance.

Pain measurement utilized VAS and MPQ. The VAS was 10 cm in length with ends anchored 'no pain' and 'worst pain imaginable'. The written instruction above the scale was 'Please mark your level of pain'. Where a patient indicated a variable pain score, for example 5-7, then the midpoint was taken (VAS=6) for statistical analysis. The MPQ was the standard form consisting of 78 words categorized into 20 groups, representing the four pain rating indices: sensory [PRI(S)], affective [PRI(A)], evaluative [PRI(E)] and miscellaneous [PRI(M)].[8] The four pain rating scores of each patient correctly completing the questionnaire were then added to give a fifth index, the total pain rating index [PRI(T)]. The written instruction above the MPQ was: 'Some of the words below describe your present pain. Circle only those words that best describe it. Leave out any category that is not suitable. Use only a single word in each category – the one that applies best.'

Statistical analyses

One-way analysis of variance (ANOVA) followed by Tukey pairwise comparison, Student's *t* test,

Table 2. Primary diagnosis of chronic orofacial pain conditions

Primary diagnosis	(n=120)	
	Number of males (n=32)*	Number of females (n=88)*
AFP	6*	34*
TMD	11	21
AO	11	18
Path	4	15

*Chi-squared test statistically significant at p<0.0001 for gender difference.

Kruskal-Wallis non-parametric analysis of variance, chi-squared test and Pearson's r were used where appropriate.

Results

Patients ranged in age from 16-87 years (mean± SD: 52±16). Females outnumbered males in the study 88:32, and for all pain conditions (Table 2).

The most frequent condition diagnosed was AFP (n=40), followed by temporomandibular disorder [TMD, (n=32)], atypical odontalgia [AO, (n=29)] and pain arising from the pathology group [Path, (n=19)]. The separate diagnoses of the Path group is shown in Table 3. However, both AFP and AO groups had substantial numbers of subjects who were diagnosed with a concurrent TMD problem. Results showed that the AFP group were diagnosed with either a single presenting complaint [AFP, (n=20)] or a combined atypical facial pain-temporomandibular disorder [AFP-TMD, (n=20)]. Similarly, AO was identified as a single complaint [AO, (n=12)] or in association with TMD [AO-TMD, (n=17)].

One subject incorrectly completed the VAS (a line was drawn past the 10 anchor with '10 million' written as a pain score) and nine subjects did not complete the VAS. Five subjects did not complete the MPQ and another 28 subjects completed the MPQ incorrectly.

Results of statistical analyses (VAS and MPQ)

Chi-squared test for gender analysis indicated there was a significantly greater number of females referred with chronic orofacial pain (p<0.0001), and a significantly greater number of females diagnosed with AFP (p<0.0001).

Table 3. Diagnosis of Path group

Pathological condition	Number of patients (n=19)
Arthritis/pathology of temporomandibular joint	5
Trigeminal neuralgia	5
Facial neuropathic pain	4
Burning tongue syndrome	2
Maxillary sinusitis	2
Anaesthesia dolorosa	1

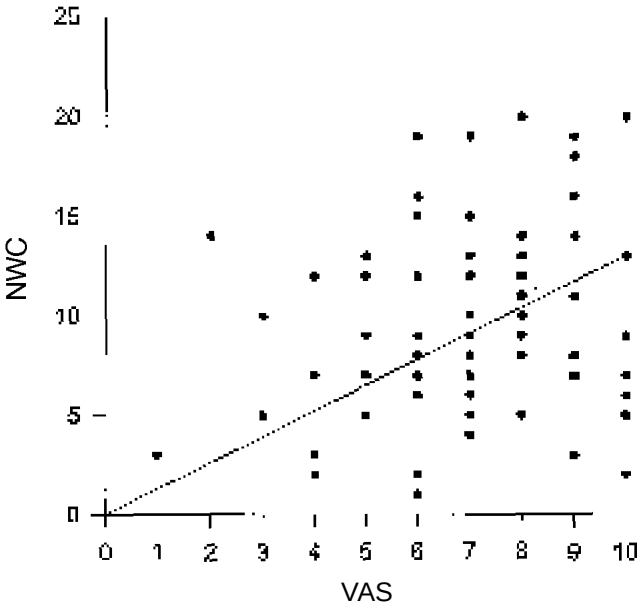

Fig. 1. – Significant positive correlation between VAS and NWC (p=0.002) in patients correctly completing MPQ and VAS (n=82). Scatterplot represents each patient score (VAS versus NWC) with line of best fit transecting the origin.

Pearson's r indicated a significant positive relationship between VAS and the number of words chosen index (NWC) across all pain conditions (p=0.002) (Fig. 1). Student's *t* tests indicated patients presenting with AFP-TMD reported significantly higher PRI(M) and PRI(T) (4.9±2.8, 26.5±12.5 respectively) than patients presenting with AFP (2.4±2.2, 15.6±8.5 respectively) (p=0.009). ANOVA indicated that patients diagnosed with AFP reported significantly lower PRI(M) and PRI(T) scores (p=0.0005) than patients presenting with TMD or Path.

Pearson's r indicated no relationship between VAS and pain duration, age or PRI(T). No significant differences were found between females and males on VAS, PRI(A) or PRI(S). In addition, all four pain conditions showed no significant difference between VAS or NWC.

Discussion

Gender differences

Females outnumbered males in the study group and throughout all pain conditions; a similar gender difference was reported in another Australian chronic orofacial pain study.[9] A specific review of TMD in 35 orofacial pain clinics[10] and two Australian studies[11,12] also showed gender differences favouring greater female attendance (approximately 3:1, females:males). An explanation of the relationship between gender and pain has produced conflicting data. Lander and co-workers[13] reported females have lower pain thresholds and lower pain tolerances than males in studies of experimental pain, and that women reported more physical symptoms (including pain) in clinical studies. However, results of this current study demonstrated no significant

Table 4. Relative pain intensity of various pain conditions as measured by PRI(T)

Pain condition	PRI(T)
Path*	27.0
Psychiatric tension headache[17]†	27.0
TMD*	26.8
AFP-TMD*	26.5
Back[8]†	26.3
Cancer[8]†	26.0
AO-TMD*	25.1
Phantom[8]†	25.0
General practice tension headache[17]†	21.4
Acute toothache[4]†	19.5
Arthritis[8]†	18.8
AO*	18.0
Menstrual[8]†	17.5
AFP*	15.6

*Data from present study.
†Data reproduced with permission from Elsevier Science.

difference of pain intensity scores between males and females. Other studies in support found no significant difference based on gender for experimental pain[10] and for acute, postextraction dental pain.[14] It has been proposed that gender differences in pain may possibly result from neuronal function influenced by hormonal variation, including activation of endogenous analgesic systems,[15] while others have found a higher incidence of females who 'actively' seek treatment for health complaints (including orofacial pain).[16] In summary, however, no definitive reason has yet been shown for gender difference in chronic orofacial pain, despite the common findings from a number of studies.

Severity of pain in chronic orofacial pain conditions

Perhaps the most important finding of this study was the 'high' pain intensity of orofacial conditions, as measured by the MPQ. TMD, a frequently encountered condition in the general population, had a mean score of 26.8 on the PRI(T) and scored higher than back pain (26.3), cancer pain (26.0) and phantom pain (25.0).[8] It is noteworthy that 65 per cent of the subjects in this study exhibited TMD as either a primary or secondary condition. The high mean pain score of TMD was only exceeded by patients with Path (27.0) and 'psychiatric tension headache sufferers' (27.0).[17] Patients diagnosed with atypical odontalgia (AO/AO-TMD, mean=22.6) and atypical facial pain (AFP/AFP-TMD, mean=21.0) scored higher than previously reported acute dental pain (19.5),[4] arthritis (18.8) and menstrual pain (17.5)[8] (Table 4). A comparative rating of pain scores using VAS and MPQ indices for the present orofacial pain study group is shown in Table 5.

Data also showed VAS pain intensity for TMD was the highest for any group (7.5±1.7). However, another analysis of TMD reported lower mean pain intensity for TMD (2.7±0.8).[10] The reason for the substantial VAS difference between these studies

Table 5. Mean scores of reported pain intensity from chronic orofacial pain conditions

Condition	VAS*	NWC*	PRI(M)	PRI(T)
AO	6.7±2.3	7.4±4.0	3.8±3.8	18.0±11.2
AO-TMD	7.0±1.6	10.4±4.1	4.9±3.0	25.1±9.0
AFP	6.7±2.5	6.8±2.8	2.4±2.2†‡	15.6±8.5†‡
AFP-TMD	7.3±2.0	10.6±5.9	4.9±2.8†	26.5±12.5†
Path	7.1±2.0	10.8±4.6	6.7±2.8‡	27.0±12.3‡
TMD	7.5±1.7	10.4±5.1	5.8±4.3‡	26.8±14.1‡

*Positive correlation (Pearson's r) between VAS and NWC; p=0.002.
†Student's *t* test statistically significant for PRI(M) and PRI(T); p=0.009.
‡ANOVA statistically significant for PRI(M) and PRI(T); p=0.0005.

cannot be identified based on the data available. However, it should be noted that there was a longer mean duration of pain in this study suggesting pain duration may be a mitigating factor for intensity ratings and deserves further investigation. Assessment of the temporal qualities of pain in this present study indicated the large majority of patients experienced 'constant' pain, while those with TN usually complained of 'intermittent' or 'periodic' pain (Table 6). However, due to the limited numbers of patients in the various subclassifications of the Path group, caution should be employed in the interpretation of data regarding pain intensity and pain description. The Path group, by definition in the context of this study, includes a vast number of conditions that would probably have a diverse range of pain intensity ratings and pain description. For example, TN generally has a high VAS and 'intermittent/periodic' temporal quality, yet a benign cyst may be barely perceptible with a resultant low VAS and probably with few MPQ descriptors listed.

Comparatively high pain scores from the orofacial region encountered in this study may be explained by anatomical and psychological factors. On a neural basis, there is a greater sensory nerve supply to the orofacial region (and hands) compared with other regions of the body. The motor functions of speech, facial expression and masticatory muscles all rely, in part, on sensory input for normal functioning, and masticatory muscle pain has been related to clinical pain intensity of TMD.[18] Sensory enervation of the peri-oral region is comparable to the fingertips for assessing spatial distribution, tactile detection, two-point discrimination and texture. In addition, the tongue and facial region are endowed with highly discriminating A-δ and C-fibre 'warming' and

Table 6. Temporal qualities of major pain conditions reported by patients

Temporal quality	(n=118)			
	AO (n=29)	AFP (n=39)	TMD (n=31)	Path (n=19)
Constant	24	35	23	13 (arthritis, n=5)
Periodic	5	4	8	4 (TN, n=2)
Intermittent	0	0	0	2 (TN, n=2)

'cooling' thermoreceptors; and the dental pulp is particularly significant for its C-polymodal receptors to elicit pain despite a 'non-noxious stimulus'. Overall, for the same noxious stimulus, neural mechanisms clearly exist for greater sensory pain of the oral cavity and peri-oral tissues compared with other body regions. In addition, a wider area of pain should also be considered as a possible causal factor for increasing pain intensity ratings. By definition AO and AFP are restricted to the oral cavity and face, but pain intensity increases when a secondary TMD is present, a condition which often involves pain in neck, shoulder and back regions.

Psychological factors can influence patients' subjective reports of pain intensity and description for reasons such as secondary emotional gain or securing increased (narcotic) medication. While no definite conclusions can be drawn as to the influence of psychological factors from data in this study, it is noteworthy that the highest rating chronic pain condition reported is 'psychiatric tension headache'. Studies have shown a high incidence of significant psychological problems in patients attending dental pain clinics.[19,20] In addition, these factors may potentially increase orofacial pain through a potential positive feedback loop; facial expression arising from 'suffering', and pain due to accentuated regional muscle contraction.[21] Interestingly, facial expression is a valid pain measuring instrument for infant physiological pain,[22] yet psychological factors limit its applications in adult experimental physiological pain due to the 'expectation of pain' in test subjects.

A majority of patients in this study exhibited TMD as a primary diagnosis (singular condition), or as a secondary diagnosis concurrent with another disorder. While TMD is classified as a secondary diagnosis in this study based on pain history (most subjects reporting the onset of TMD symptoms subsequent to the initial pain complaint), it could be arguably the primary pain condition through the relative VAS ratings (AO-TMD, AFP-TMD). It is unclear why a secondary TMD condition arises, however, bruxism may provide pain relief through neural inhibition. Evidence of parafunction and signs of functional disturbances have been demonstrated in patients with 'oral discomfort' as a result of other dental pathology.[23] Future studies may prove bruxism to be a pain-coping mechanism for other chronic orofacial pain conditions through central mechanisms, and thus be of positive benefit. However, the benefit is negated through a worsening of the overall pain state by the subsequent development of secondary myofascial pain.

Clinical aspects and parameters of using VAS/MPQ; and interinstrument relationships

The VAS is generally considered to be a simple and reliable pain measuring instrument for patients. However, this study showed one subject incorrectly completed the VAS and eight per cent of subjects did not complete the VAS. Similar results have been reported of 11 per cent of respondents not completing the VAS.[24] Although the scale has internally consistent ratio scale properties in experimental and chronic pain, the instrument limits patients to express their 'usual' level of pain. However, pain intensity can vary markedly over time and activities, illustrated by daily log charts, and this deficiency of the VAS was the main reason given by non-respondents.

In this study, 32 per cent of subjects did not attempt, or incorrectly completed the MPQ. Several patients who did not attempt to complete the MPQ stated their reasons as 'it was too involved' or 'did not feel that the questionnaire could express the pain adequately'. The majority of patients who completed the MPQ incorrectly, claimed that the questionnaire could not be completed in the way designed, with only one word descriptor per group. The most frequently volunteered response from these patients was that their pain often varied and, therefore, two or more words were chosen from within the word group. Unfortunately, this constraint of the MPQ precludes the use of substantial patient data in statistical analysis, and thus can reduce the instrument's research productivity. The limitation of one word per group needs further deliberation by pain researchers, perhaps allowing mean rank values in a word group, where more than one word is selected. While VAS scores were similar for pain conditions in this study, the MPQ analysis showed a significant difference in various aspects which may prove valuable in diagnosis and treatment. Results showed particular MPQ scales were discriminant in distinguishing a single pain condition from a multiple pain complaint; AFP to AFP-TMD showed an increase in the PRI(M) and PRI(T). This potential diagnostic capability of the MPQ is an obvious advantage over the VAS. While a correlation between VAS and sensory word descriptors has been previously reported, this study showed a significant correlation between the VAS and NWC index of the MPQ. While most published studies report PRI scores, this study found NWC to be extremely useful and pain intensity may be more accurately portrayed using the frequency of word descriptors rather than ranked totals of words.

An advantage of pain research in the orofacial region is the possibility of comparing data of acute pain and chronic pain from the same anatomical location or region. For example, an MPQ analysis of acute 'toothache' found only three descriptors were chosen by more than one-third of patients.[4] In contrast, data from this study for chronic conditions showed patients with AO-TMD (n=17) listed nine descriptors, AFP-TMD (n=20) listed ten descriptors,

Table 7. Frequency of MPQ pain descriptors (%) when listed by more than one-third of patients in each category

Descriptor	AO (n=11)	AO-TMD (n=17)	AFP (n=17)	AFP-TMD (n=20)	Path (n=18)	TMD (n=32)
Throbbing	33	59	37	57		34
Shooting		41	37	43	37	
Stabbing		35			37	
Sharp	33	41			42	38
Burning					42	
Aching	50	35	37	48	37	50
Tender	33	53		33		
Tiring		35				
Exhausting	33			43	37	
Sickening		47		43		
Intense	33			52	68	34
Radiating				38		
Tight				38		
Nagging	42	35				
Agonizing				33		
Dreadful	33					

and those with pathology (n=18) listed seven descriptors (Table 7). It is proposed by the authors that the marking of affective pain description words by afflicted patients, thus establishing a psychological component, is an early warning in the progression of acute to chronic pain. Currently, the accepted definition of chronic pain is pain present for more than six months. This is an arbitrary decision based on the 'average' pain patient in a linear time frame; it does not take into account background medical conditions such as diabetes and environmental/psychological factors which may predispose the patient to an earlier chronic pain state. The selection of affective pain words in the MPQ by a patient should be carefully noted by the dental practitioner, for it suggests specialist psychological treatment is needed. It is recommended that, where possible, patients requiring multiple assessments be referred to a multidisciplinary pain centre for investigation and an overall management plan.

Complexity of diagnosis: the prevalence of two concurrent conditions

Results from this study showed that 65 per cent of patients were diagnosed with more than one pain condition of the orofacial region. These concurrent conditions would presumably lead to greater difficulty in diagnosis due to mitigating factors such as complex regional anatomy and psychological variables. Perhaps an additional factor for the orofacial region is that various medical and dental disciplines are responsible for diagnosis and treatment, with acute dental pain, maxillary sinus pain from infection and organic neurological disorders of the face being routinely assessed by the respective dental practitioner, medical practitioner/otolaryngologist and neurologist/neurosurgeon. Therefore, there is the possibility of delay in diagnosing chronic pain from dental structures when the pattern of referral (to antrum, ear or face) leads the patient to inappropriate referral among medical specialist disciplines. Chronic orofacial pain may involve neural mechanisms, and vascular and musculoskeletal components, in addition to psychological factors. To illustrate the complexity of even a single condition such as AO, there is now evidence that it is a form of neuropathic pain with associated hyperalgesia, allodynia and, frequently, a sympathetically maintained pain component. However, once a condition such as AO is established there is a high incidence in the development of a secondary TMD condition. Few studies investigating chronic orofacial pain have suggested multiple pain states, the large majority of studies specifically labelling a patient with only one diagnosis. Results of this study conflict with the concept of 'one patient – one diagnosis'. Indeed, the revised IASP taxonomy clearly addresses and supports the data obtained from this study, in that patients have 'complex regional pain syndromes' (CRPS). A further difficulty for diagnosing patients has been the often confusing differences in dental and medical nomenclature. This is well illustrated in definitions and criteria for diagnosis of orofacial pain conditions such as TMD, AO and AFP among pain specialists, dental specialists and neurologists.[1,25] Unfortunately, it is necessary for dental practitioners at the current time to be aware of the existence of different taxonomies of pain terms and definitions from medical and dental disciplines. The adoption of a single taxonomy among health practitioners, irrespective of background discipline, is to be encouraged.

Conclusion

Patients in this study frequently claimed 'constant' pain, and several orofacial conditions rate higher pain intensity than other medical pain conditions. It has been witnessed by the investigators that constant and severe pain, for some orofacial pain patients, has led to life-threatening situations (high suicide risk or attempted suicide), underlying the serious impact of pain in this area. The puzzling nature of concurrent

pain conditions has often confounded the referring dental surgeon. Traditionally, dental education has relied on an oversimplistic understanding of chronic pain. This has been based on two outdated pain models. Firstly, the Cartesian model of pain, where removal of the peripheral area where the patient reports pain is hoped to remove the pain with the 'amputated' body part. Secondly, the conventional representation of the afferent nervous system refers to a 'hard-wired' system with pain unable to cross anatomical boundaries such as the midline. However, recent data have shown that peripheral sensitization is associated with localized or primary hyperalgesia and central sensitization is associated with secondary hyperalgesia, which may spread vertically and may cross the midline, afferent pathways having the potential to exhibit plasticity following peripheral nerve damage. The nature of pain referral, and indeed patient referral, among disciplines such as surgeons (ear, nose and throat specialists), neurologists and dental surgeons also make for a diagnosis that is difficult and potentially delayed. Delayed diagnosis can, and often does, prolong subsequent treatment resulting in diminished successful outcomes. In summary, orofacial pain may be exceedingly complex, based on anatomical and psychological factors, little understood variables such as gender, and complex biochemical events and neurophysiological mechanisms involved in the pathophysiology of chronic pain.

The MPQ and VAS are relatively simple instruments that provide valuable data for assessing and managing the afflicted patient. Both instruments are limited, however, in their lack of application to specific patient groups such as infants, mentally handicapped patients, and migrants with limited knowledge and understanding of pain terms in the host country. Nevertheless, for the dental surgeon, both the VAS and MPQ serve as pain measuring tools that are non-invasive and easily completed by the patient. Multiple scores can be recorded over time for baseline pain intensity and subsequent treatment efficacy. The instruments are easily applicable in a dental clinic setting and, for chronic pain patients, the data may be compared directly with findings from this study. This will help the practitioner in assessing the severity and diagnosis of a condition(s), with referral to specialists or a pain management centre where appropriate.

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