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Original Article

Epidemiology of Non-Odontogenic Pain in UiTM Dental Centre: A Retrospective Study

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ABSTRACT

Objective: *The purpose of this retrospective study is to analyse the prevalence of patients referred to the Oral Medicine Clinic at UiTM Dental Centre that are diagnosed with non-odontogenic pain. This study is also done to classify the type of non-odontogenic pain that is most common to least commonly diagnosed while studying its correlation to age and gender.* ***Methods:*** *200 patients referred to the Oral Medicine Clinic at UiTM Dental Centre and have been diagnosed by the specialist are selected. Their data including the diagnosis, age and gender are retrieved from the centre's online dental records.* ***Results:*** *Among 109 patients, 72.5% are female while 27.5% are male. Most commonly diagnosed non-odontogenic orofacial pain is from musculoskeletal origin (83.1%), followed by neuropathic origin (6.8%), neurovascular (5.1%) and psychogenic (5.1%).* ***Conclusion:*** *Non-odontogenic pain mostly affected women compared to men, and the most common age to be affected is in the range of 21-30 years old. The most commonly diagnosed non-odontogenic pain is from musculoskeletal origin.*

Keywords: *Toothache, Non-Odontogenic toothache, Orofacial Pain*

INTRODUCTION

Most patients come to the dentist with a complaint of pain, mainly in the orofacial region. Orofacial pain is a term used to describe the dysfunction or pain felt in the head and neck region, including the oral cavity.

There are two sources of orofacial pain, mainly odontogenic origin and non-odontogenic origin. 95% of orofacial pain is from odontogenic origin, which means that it comes from the tooth such as toothache caused

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by pulpitis or dental abscess, pericoronitis and dentine hypersensitivity (Scully, 2008). Meanwhile, the remaining orofacial pain is from non-odontogenic origin. It may be derived from various structures including musculoskeletal (Hargreaves, 2011) such as temporomandibular disorders (TMD: Renton, 2012) and myofascial pain (Hargreaves, 2011). It can also be derived from neuropathic (Renton, 2012), neurovascular (Benoliel, 2010) and psychogenic (Hargreaves, 2011) origin, although that is rare.

The clinical presentation of non-odontogenic pain varies, ranging from mild to severe pain, acute to chronic onset and intermittent to continuous characteristics. Acute pain is usually triggered suddenly and only lasts for a while, while chronic pain lasts longer; weeks or months. Chronic pain can negatively affect the patients' daily activities, such as chewing, speaking and tooth brushing. Chronic orofacial pain also disturbs sleep quality, thus reducing patients' quality of life (Haviv, 2017).

Also, orofacial pain may mimic toothache. Due to the various structures in the head and neck region, along with complex cranial nerve innervation, coming up with a list of differential diagnoses is difficult. A study by Oberoi (2013) found that several studies have similar patterns of distribution of orofacial pain symptoms. Toothache was the most common symptom, followed by TMD pain (Shaefer, 2018). Hence, it is very important for clinicians to establish a definitive diagnosis to plan a proper treatment for the patient.

Countless studies have been carried out to find out the cause of orofacial pain specifically, but the order of commonness is unknown. In addition to that, there is still lack of studies done on the prevalence of non-odontogenic pain in Malaysia. Since UiTM Dental Centre is one of national centres for orofacial pain, a high number of patients were referred here. Being able to identify the prevalence would be really helpful in diagnosis and treatment planning. The objectives of this study are to analyse the prevalence of patients at Oral Medicine (OM) Clinic of Universiti Teknologi Mara (UiTM) Dental Centre that were diagnosed with non-odontogenic pain and to classify the type of non-odontogenic pain, from the most common to the least common. In addition to that, we also strive to study the correlation of type of non-odontogenic pain with age and gender.

MATERIALS AND METHODS

Study Design

This retrospective study analysed the prevalence of patients diagnosed with non-odontogenic pain by the specialist at OM Clinic of UiTM Dental Centre, Sg Buloh, Selangor, Malaysia. The types of non-odontogenic pain are categorised from the most commonly diagnosed to the least commonly diagnosed while finding its relations with patients' sociodemographics such as age and gender.

Study Population

In total, UiTM Dental Centre has received over 60,000 patients since it started its operations in 2008. This study only incorporates patients whose data are recorded in Integrated Dental Record Management System (iDeRMS). Then, these patients are further classified into smaller groups according to their age and gender while correlating to their diagnoses that were diagnosed by the specialist from 2016 to 2019. The sampling technique chosen is simple random sampling whereby a group of subjects is selected from the population and each individual is chosen by chance. In addition, each member of the population has an equal chance or probability of being included in the sample. The sample size calculation was done using an Android application, the Epi Info version 1.4.3. and the sample size came up at 109 patients.

Data Collection

UiTM's very own iDeRMS are currently being used by all members of the dental centre from the undergraduate and postgraduate students to specialists and also staff nurses. It contains all of the patients'

records. The data collection period is from January 2016 to December 2019. Throughout the years, analysis of the patients in OM clinic was done. Each and every patient's records were studied, taking note of their age, gender and their diagnosed non-odontogenic orofacial pain. These data were then tabulated in Microsoft Excel before proceeding with statistical analysis.

Statistical Analysis

The software used for statistical analysis is an SPSS Software version 25.0 with Pearson's chi-squared test. Pearson's chi-squared test is a statistical test applied to sets of categorical data to evaluate how likely it is that any observed difference between the sets arose by chance. The data will be classified into age, gender and their diagnosis. Using this information, the prevalence of a diagnosis can be correlated to independent variables, which are factors to the diagnosis such as age and gender. These factors are used to estimate their influence on the population that contribute to the diagnosis. The calculation of prevalence and incidence will determine the epidemiology and thus verify our objectives.

RESULTS

Based on this retrospective study conducted on a total of 109 non-odontogenic patients, females make up the majority of the samples at 72.5% (79) while the remaining 27.5% (30) are male, indicating a higher prevalence of non-odontogenic pain in females. The mean age of the total samples is 33.6 years old, whereby for females is 33.9 years old and for males is 32.8 years old. 40.7% of the total samples are within the range of 21-30 years old which concludes that non-odontogenic pain is commonly diagnosed within the younger adults (Table 1).

There are still various opinions regarding the classification of orofacial pain, but when focusing mainly on specific organ systems, non-odontogenic pain is classified into the following four categories, musculoskeletal, neuropathic, neurovascular, psychogenic pain.

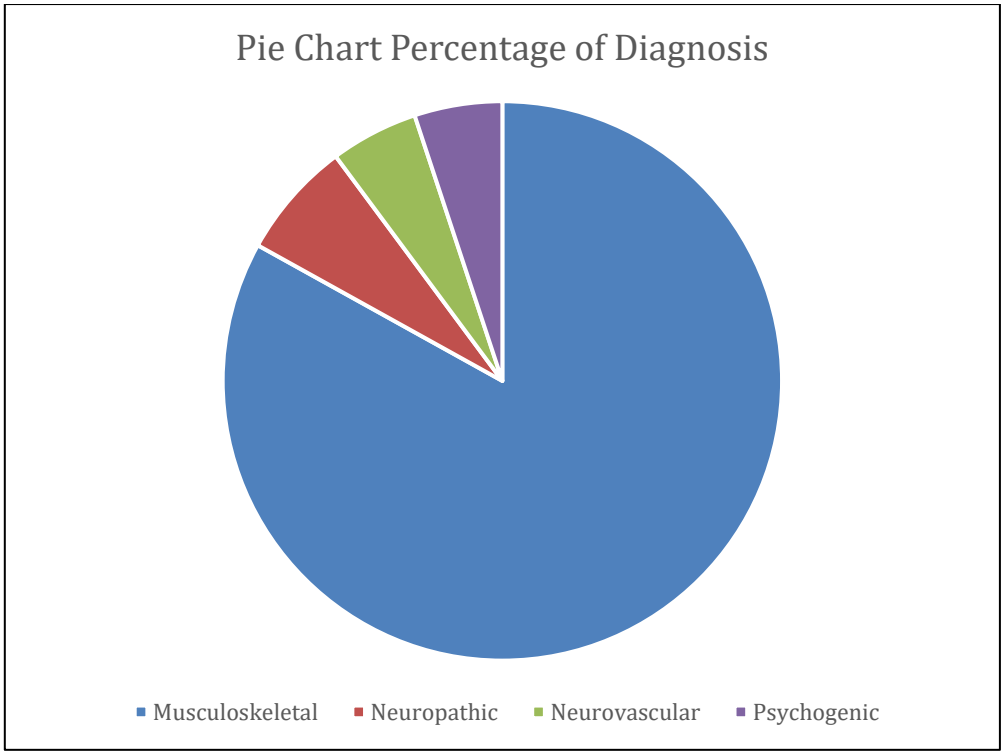
The most commonly diagnosed non-odontogenic pain in the study patient group is musculoskeletal pain (Graph 1) at 83.1% or 98 patients (Table 2). 61.9% or 73 patients from this category are females and another 21.2% or 25 patients are males (Graph 2). In total, 83% of females and 83.3% of the male population have been diagnosed with musculoskeletal pain (Table 3). Most patients in this diagnosis group are in the range of 21-30 years old with a percentage of 34.7% or 41 patients (Graph 3). Moreover, 85.4% of patients from this age group were diagnosed with musculoskeletal pain.

This diagnosis category is followed by neuropathic pain with a percentage of 6.8% or 8 of the total patients. Females also make up most of the patients in this diagnosis category with a total of 6 patients or 5.1%. The remaining 2 patients or 1.7% are males. 6.8% of total females and 6.7% of males has been diagnosed with neuropathic pain. 51-60 years old is the most common age to be diagnosed; with 4 patients or 3.4%. 33.3% of patients from this age group were diagnosed with neuropathic pain.

Neurovascular pain and psychogenic pain are the least commonly diagnosed non-odontogenic pain, both having 6 patients or 5.1% of the total patients. However, for neurovascular pain, 4.2% or 5 patients are females and the remaining 1 patient or 0.8% is male. 5.7% of females and 3.3.% of males have been diagnosed with neurovascular pain. For psychogenic pain, 4 patients or 3.4% are females that followed by 2 patients or 1.7% that are males. 4.5% of females and 6.7% of males from the total patient group is diagnosed with psychogenic pain. Both of these diagnosis categories are prevalent in the 21-30 years old age group with a total of 3 patients or 2.5%. 6.3% of patients in this age group were diagnosed with neurovascular pain and psychogenic pain, respectively.

			AGE							
			10-20	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**Total**
DIAGNOSIS	Musculoskeletal	Count	13	41	19	13	7	4	1	98
		% within Age	100.0%	85.4%	90.5%	76.5%	58.3%	80.0%	50.0%	83.1%
		% of Total	11.0%	34.7%	16.1%	11.0%	5.9%	3.4%	0.8%	83.1%
	Neuropathic	Count	0	1	1	1	4	0	1	8
		% within Age	0.0%	2.1%	4.8%	5.9%	33.3%	0.0%	50.0%	6.8%
		% of Total	0.0%	0.8%	0.8%	0.8%	3.4%	0.0%	0.8%	6.8%
	Neurovascular	Count	0	3	1	2	0	0	0	6
		% within Age	0.0%	6.3%	4.8%	11.8%	0.0%	0.0%	0.0%	5.1%
		% of Total	0.0%	2.5%	0.8%	1.7%	0.0%	0.0%	0.0%	5.1%
	Psychogenic	Count	0	3	0	1	1	1	0	6
		% within Age	0.0%	6.3%	0.0%	5.9%	8.3%	20.0%	0.0%	5.1%
		% of Total	0.0%	2.5%	0.0%	0.8%	0.8%	0.8%	0.0%	5.1%
TOTAL		Count	13	48	21	17	12	5	2	118
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	11.0%	40.7%	17.8%	14.4%	10.2%	4.2%	1.7%	100.0%

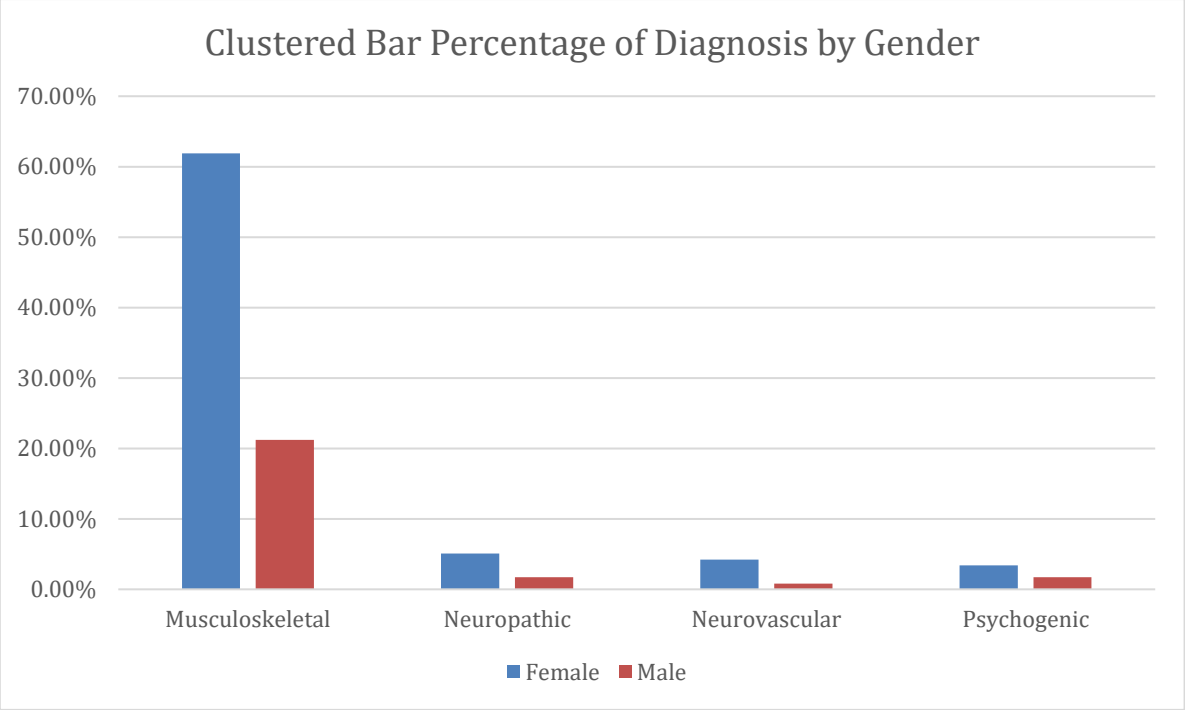
Table1: Diagnosis *Age Crosstabulatio



Graph 1: Pie Chart Percentage of Diagnosis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Musculoskeletal	98	83.1	83.1	83.1
	Neuropathic	8	6.8	6.8	89.8
	Neurovascular	6	5.1	5.1	94.9
	Psychogenic	6	5.1	5.1	100.0
	Total	118	100.0	100.0	

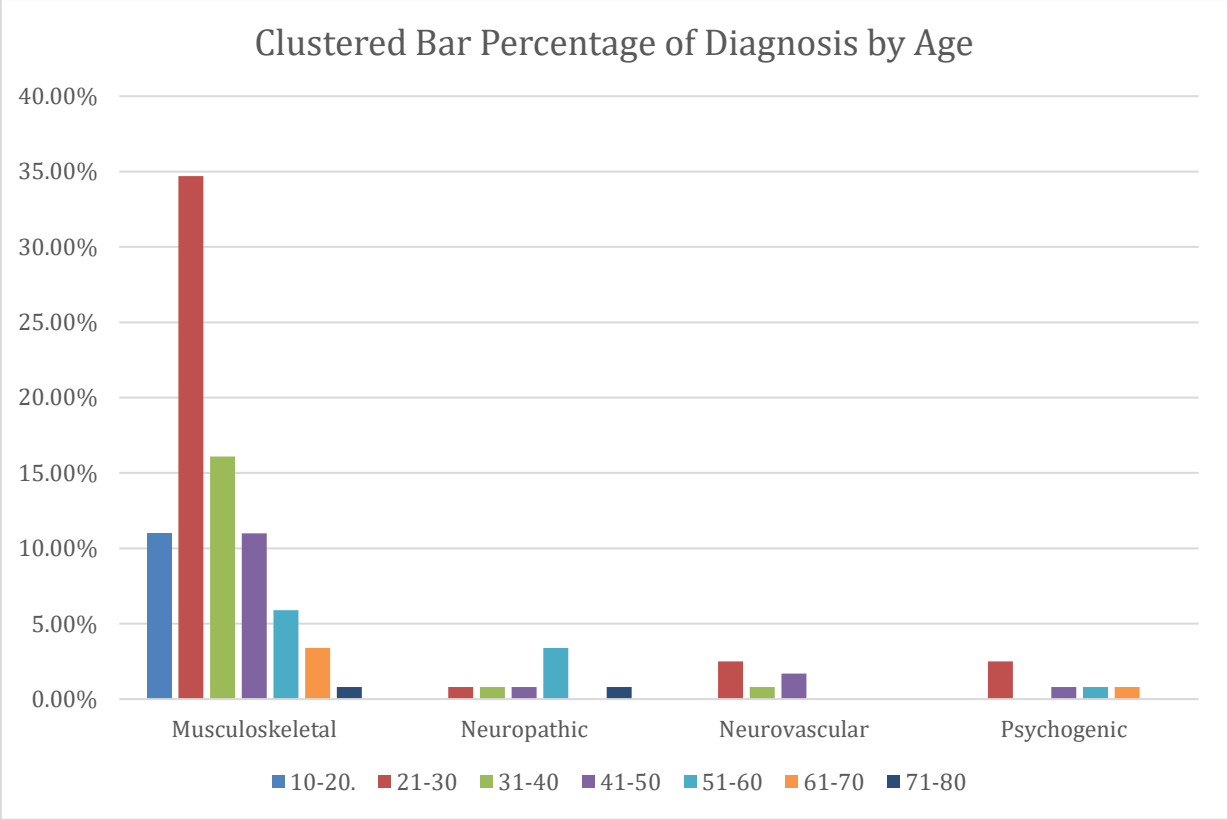
Table2: Diagnosis Crosstabulation



Graph2: Clustered Bar Percentage of Diagnosis by Gender

			Gender		Total
			Female	Male	
Diagnosis	Musculoskeletal	Count	73	25	98
		% within Gender	83.0%	83.3%	83.1%
		% of Total	61.9%	21.2%	83.1%
	Neuropathic	Count	6	2	8
		% within Gender	6.8%	6.7%	6.8%
		% of Total	5.1%	1.7%	6.8%
	Neurovascular	Count	5	1	6
		% within Gender	5.7%	3.3%	5.1%
		% of Total	4.2%	0.8%	5.1%
	Psychogenic	Count	4	2	6
		% within Gender	4.5%	6.7%	5.1%
		% of Total	3.4%	1.7%	5.1%
Total		Count	88	30	118
		% within Gender	100.0%	100.0%	100.0%
		% of Total	74.6%	25.4%	100.0%

Table 3 Diagnosis * Gender Crosstabulation



Graph 3: Clustered Bar Percentage of Diagnosis by Age

DISCUSSIONS

In this retrospective study, we collected the diagnosis of 109 patients and found that there is a large discrepancy between the number of male and female patients. There is no explanation for this discrepancy, however it may be explained by the role of gender norms and pain tolerance. Pool (2007) found that both women and men believed that the ideal man should tolerate pain more than the ideal women. They also found that individuals who strongly identify with their gender group are more likely to behave accordingly. This study suggested that the differences in pain expression among the two genders are correlated to the gender-specific social norms. Previous studies also supported this statement, as they found that men tolerate more pain than women under experimental settings that includes various pain induction techniques such as pressure pain (Otto, 1985), cold presser pain (Levine, 1991), thermal pain (Wise, 2002), and electric shock pain (Robin, 1987)).

Our study also found that most non-odontogenic pain arises from musculoskeletal origin, specifically temporomandibular joint disorders. Musculoskeletal pain is an umbrella term that can be used to describe pain that includes myogenous and arthrogenous sources of pain. Shaefer (2018) reported that temporomandibular disorders are the most prevalent type of orofacial pain, affecting 5% to 12% of adults. Lipton (1993) found that females had twice the rate of TMJ pain and more than twice the rate of orofacial pain compared to males. This suggests that females are more prone to developing pain. These could be explained by a few factors, such as illness behaviour, where one gender is affecting the use of health care for pain in the jaw more than the other. Other factors would be the relation between gender and hormones. Craft (2007) found that onset of TMD in women is typically seen after puberty and decline post-menopausal. Craft also reported on a laboratory study model of TMD pain using glutamate injection into the masseter muscle found that women

reported more pain compared to men. However, when compared between women taking oral contraceptives and those who did not, there were no differences in pain.

The second most commonly diagnosed from our study is neuropathic pain. Neuropathic pain is described as one of the most painful conditions in the orofacial region. From our study, all of our neuropathic pain patients are diagnosed with trigeminal neuralgia (TN). TN is a sudden and severe facial pain that is usually described as a sharp shooting electric-like pain. Zakrzewska (2011) described that there are two types of neuralgia. The first type (TN1) is an intense, stabbing pain while the second type (TN2) is described as less intense pain, but with a constant dull or aching pain. It has been understood that TN1 is idiopathic, but it can be caused by a blood vessel pressing on trigeminal nerve. TN2 is believed to be caused by underlying causes such as tumour or multiple sclerosis as well as compression of trigeminal nerve and unknown causes. Our study found that most patients who are diagnosed with TN are female ranging from age 51 to 60 years old. However, we did not classify our findings according to the type of TN. A systematic review (De Toledo, 2016) found that the prevalence of neuralgia was 0.03% to 0.3% and it mostly affected women. They also found that people from 37 to 67 years old were mostly affected.

Neurovascular pain is usually classified as migraines and lower cluster headaches. These patients usually present with lower facial pain along with nausea and photophobia or phonophobia. In our study, patients who are diagnosed with neurovascular orofacial pain are mostly women. A study (Benoliel, 1997) involving patients diagnosed with orofacial pain with vascular type features found that 70% of the patients were women, with an average onset of 42.6 years. In our study, 3 of the patients were under 21-30 years old, while 2 of them were under 41-50 years old. They also did another study where they surveyed additional 23 patients who were diagnosed with neurovascular pain, which consisted of seven men and 16 women. In this study, they found that the mean onset age was 39 +/- 13.7 years. Sharav (2019) summarized 131 NVOP patients from various studies found that the mean onset age is 40.9 and female to male ratio is 3.2:123.

Psychogenic pain is a pain disorder that is associated with psychological factors, such as mental or emotional problems that may cause prolonged pain. These patients may present with pain that does not match their symptoms. From our study, only 6 patients are diagnosed with psychogenic orofacial pain, with 3 of them being in the age group of 21-30 years old. 4 of the 6 patients are female. A study (Feinmann, 1983) on psychogenic orofacial pain found that among 93 patients, 54% were diagnosed with facial arthromyalgia while 46% of them were diagnosed with atypical facial pain. This study also found that 63 of their patients diagnosed are women, while 20 of them are men. The mean age of women diagnosed with facial arthromyalgia were younger (36.8) compared to atypical facial pain (45.7). However, there are no differences in mean age of men diagnosed with facial arthromyalgia (35.4) and atypical facial pain (42.7).

CONCLUSION

In our study involving 109 patients, we found that non-odontogenic orofacial pain mostly affected women than men. Our patients are mostly diagnosed with musculoskeletal pain, followed by neuropathic, neurovascular and psychogenic pain. Dental practitioners should be knowledgeable of the type of pain presented besides taking full history and doing examinations to fully come to a diagnosis.

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