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PREVALENCE OF PAIN IN THE OROFACIAL REGION AND ITS ASSOCIATION WITH QUALITY OF LIFE IN GENERAL POPULATION OF BANGALORE CITY, KARNATAKA: A CROSS-SECTIONAL STUDY

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ABSTRACT

BACKGROUND AND OBJECTIVES: Head, face and neck pain affects a large portion of the world population, however there are few studies reporting this condition in general Karnataka population. This study aimed at investigating the prevalence of head, face and neck pain and its impact on the quality of life of adults of Bangalore city, Karnataka.

METHODS: The sample was made up of 400 volunteers of both genders, aged between 20 and 50 years, who were randomly approached in six crossing points of the city. Socio-demographic, pain prevalence, location, frequency, duration and severity, and self-perception of quality of life data were collected by means of anonymous self-applied questionnaires: Orofacial Pain Questionnaire and Quality of life evaluation questionnaire.

RESULTS: Pain prevalence was 54.75%, of predominantly severe intensity (21.30%), daily recurrence (41.10%) and present for more than six months (91.32%). Most affected region was the head (36%) being the intraoral region the less frequently reported (6%). There has been no significant association between pain and factors such as age, economic level and education ($p>0.05$); however

there has been significant prevalence among females. No pain was frequently associated to better quality of life ($p<0.05$). Volunteers reporting pain were more unhappy with quality of sleep ($p<0.05$), however there has been no significant association with the frequency of negative feelings.

CONCLUSION: The study has identified high prevalence of head, face and neck pain, significant morbidity of people affected by this condition and its negative impact on quality of life.

Keywords: Chronic pain, Prevalence, Quality of life

INTRODUCTION

Epidemiology may be defined as the "*study of distribution and determinants of health-related states or events in specific populations and the application of this study to control health problems"*[1]. Epidemiological studies in the area of pain are important because they provide information about its prevalence in different population segments and about factors associated to its etiology and persistence, being very useful for health professionals and for the development of pain-fighting programs[2].

Currently being considered a severe public health problem, pain, the prevalence of which is growing, is the primary reason for the search for health assistance by the general population[3].

Among most frequent pain complaints there are those in head, face and neck[4], the socalled orofacial pains (OFP), which may affect head, face and neck soft and hard tissues[5]. Population studies have shown that the prevalence of oral complex and craniofacial pain is high, affecting approximately one fourth of the population at least once in life[6].

OFP may be classified in different ways. One of them differentiates acute from chronic pain. Acute pain is commonly associated to toothache and periodontal pain. Persistent or chronic pain is more frequent in temporomandibular disorders and idiopathic facial pain[7-11].

When pain persists and become chronic it may negatively impact quality of life (QL). Pain becomes the primary focus of patients' attention, may produce physiological disorders, change emotional balance and cause social and professional losses such as sleep disorders, physical and emotional fatigue, loss of social contact, difficulty to eat, daily life activities limitation and absenteeism at work[12-16]. In the dental area, individuals affected by OFP suffer major changes in their daily activities, among them, dissatisfaction with oral condition, drug ingestion and dietary changes, which may affect QL more than other systemic conditions such as diabetes, hypertension or ulcer[17].

The high prevalence of head, face and neck pain and its negative repercussions on QL of individuals have been the focus of public

health investigations, due to the morbidity that may be caused by such conditions. However, notwithstanding the relevance of such symptoms, Brazilian epidemiological studies involving the general population are still scarce and most of them use convenience samples such as populations linked to treatment clinics or assistance units, which makes difficult the establishment of social and health policies prioritizing and making feasible adequate prevention and treatment, minimizing health costs and especially the distress of those suffering pain, especially chronic pain.

So, this study aimed at estimating the prevalence and characteristics of head, face and neck pain in the general adult population of the city, and at correlating them to health and QL self- perception.

METHODS

This is a cross-sectional and observational study with the adult population of the city of Bangalore, Karnataka. Participated in the study 400 volunteers of both genders (200 males and 200 females), aged between 20 and 50 years (mean of 34.70 years and standard deviation of 8.75 years), coming from 68 districts of the city and who were randomly addressed in six crossing points of the city with major population movement. Sample size was calculated as from the official city population, or 385, 287 inhabitants, with confidence level of 95% and confidence interval of 5%.

Data on OFP prevalence and characteristics and QL self- perception were collected by means of two structured, standardized and pre-tested anonymous and self-applied questionnaires: Orofacial Pain Questionnaire and Quality of Life Evaluation questionnaire.

Orofacial pain questionnaire

Developed by the authors, with no intention of being a diagnostic tool, the questionnaire is made up of questions aiming at sample demographic characterization (gender, age, education level, economic condition, district of residence), six questions to evaluate the presence of OFP and, when present, pain characteristics (pain site, frequency, duration, intensity and location according to head and neck topographic anatomic regions), one question related to recent head, neck or jaw traumas, drug consumption, treatments and the presence of systemic disease. An Economic Classification Index (ECI) was developed based on the sum of points attributed according to answers to some questions. Those who did not receive government benefits received 10 points, those with their own home 20 points, if the home was already paid 20 additional points and if it was financed only 10 points. If their home had a swimming-pool, 40 points and if the

person had access at home to broadband Internet, 10 points. According to calculations, a volunteer may receive a score varying from zero (with government bene- fit, without access to broadband Internet, without own home and without swimming-pool in the house they lived) up to 100 (no government benefit, with own home paid and with swimming-pool, and with access to broadband Internet).

All volunteers were classified according to described criteria and afterward the classification was made in quartiles.

Data collection

Questionnaires were applied in six different crossing points selected for allowing the approaching of people of different socio-economic levels, age and gender and from all regions of the Bangalore city: Central Terminal of Urban Buses System Integration, Dental colleges, traditional commercial areas, Shopping Malls. Volunteers approached at the Dental colleges did not include patients being treated in the institution's graduation or post-graduation clinic, but rather employees of the institution and escorts of dentistry clinic patients.

Individuals were randomly approached and invited to participate in the research. In case of acceptance, study objectives and methods were clearly presented in writing. After reading and signing the Free and Informed Consent Term, Orofacial Pain Questionnaire was applied, followed by the Quality of Life Evaluation Questionnaire. If there was no pain, volunteers were oriented to answer questions for socio- demographic evaluation

Data collection was standardized and carried out only in the morning, approaching individuals before going to work, were approached before beginning of the work day to prevent tiredness built-up during the work day and which could influence answers.

Statistical analysis

Data were analyzed by the statistical program SPSS 23. Univariate contingency tables and correlated Chi-square tests for proportions equality test were built. Two-dimension contingency tables were built to study the existence of association among variables. Cochram, Mantel and Haenszel test was applied to correlate answers scores in different lev- els of variables adopted as factors. Additionally, Odds ratio was calculated. To test the existence of association among variables used to build two-dimension tables, Mantel and Haenszel Chi-square test was used for ordinal factors and Wald test was used for nominal factors. Significance level for all tests was 5% (P=0.05).

RESULTS

From a total of 400 participants, 200 (50%) were females and 200 (50%) were males, with mean age of 34.7 years. As to education level, only two volunteers (0.50%) have stated having no education. Approximately half the volunteers had completed high school (49.75%), while 106 (26.63%) had stated having incomplete high school and 92 (23.12%) had finished college. Mean ECI was 41.23 with prevalence of quartile 3 made up of 190 volunteers (47.50%), followed by quartile 2 with 97 people (24.25%), quartile 1 with 83 volunteers (20.75%) and quartile 4 corresponding to 7.50% of the sample, or 30 volunteers **(Table 1)**.

Observed head, face and neck pain of 54.75% had no statistically significant difference (p=0.0574), with predominantly severe intensity (21.30%), daily frequency (41.10%) and lasting for more than six months (91.32%), being head the region most commonly indicated (36%), followed by shoulders (22.25%), face (20.00%), neck (19.25%), teeth (9.50%) andintraoral region (6%) **(Table 2)**.

Aiming at checking pain prevalence indices variation according to gender, age, education level and economic condition variables, Cochram, Mantel and Haenszel test was applied to the first variable and Chi-square test was applied to remaining variables **(Table 3)**. There has been no statistically significant difference between pain prevalence and age (p=0.77), education level (p=0.30) and economic condition (p=0.94); however, the study has observed higher frequency of pain reports by females (p<0.0001). Odds ratio analysis suggests a risk 1.57 times higher of females having head, face and neck pain as compared to males, however there has been no evidence that individuals of a certain age group, education level or specific economic condition would be at higher risk to develop OFP.

Mantel and Haenszel Chi-square test provides sound evidenc- es (p<0.01) of a linear association between pain and QL and sleep quality self-perception, so that it is less probable to be happy with sleep or to report a good QL when there is pain **(Tables 4 and 5)**. Pain intensity was also linearly associated to QL self-perception (p=0.0002) **(Table 4)**. However, there has been no significant association between frequency of negative feelings, such as depression, anxiety, bad mood, despair and OFP reports (p=0.11) **(Table 5)**.

Table 1: Frequency and percentage of socio-demographic data and Chi-square test p-value for equality of proportions

Factors	Categories	Frequency (n)	Percentage (%)	p-value
Gender	Male	200	50.00	1.0000
	Female	200	50.00	
Age (years)	20 – 30	132	33.00	0.9200
	30 – 40	137	34.25	
	40 – 50	131	32.75	
Education	No education	2	0.50	0.0001
	Incomplete high	106	26.63	
	Complete high	198	49.75	
	College	92	23.12	
Economic condition	Quartile 1	83	20.75	0.0001
	Quartile 2	97	24.25	
	Quartile 3	190	47.50	
	Quartile 4	30	7.50	

Table 2: Frequency and percentage of orofacial pain classifications reported by volunteers and p-value of Chi-square test for equality of proportions

Pain characteristics	Category	Frequency (n)	Percentage (%)	p-value	
Presence	Yes	219	54.75	0.0574	
	No	181	45.25		
Frequency	Daily	90	41.10	a	0.0001
	Weekly	51	23.29	b	
	Seldom	34	15.53	bc	
	Monthly	30	13.70	c	
	Fortnightly	14	6.39	d	
Chronicity	Chronic	200	91.32	a	0.0001
	Acure	6	2.74	b	
	Sub-acute	13	5.94	b	
Intensity	Absent	181	45.36	a	0.0001
	Severe	85	21.30	b	
	Moderate	64	16.04	b	
	Unbearable	41	10.28	c	
	Mild	28	7.02	c	
Location	Head	144	36.00	a	0.0001
	Shoulders	90	22.25	b	
	Face	89	20.00	b	
	Neck	77	19.25	b	
	Teeth	38	9.50	c	
	Inside mouth	24	6.00	c	

Percentages with equal letters are not different among them in a same characteristic by Chi-square test (P=0.05).

Table 3: Quality of life self-perception with and without orofacial pain and quality of life level with regard to pain intensity

Groups	Good		Indifferent		Poor		p-value
	n	%	n	%	n	%	
With pain	48	21.92	147	67.12	24	10.96	0.0001
Without pain	78	43.09	97	53.59	06	3.31	
Mild pain	8	28.57	18	64.29	2	7.14	0.0002
Moderate pain	17	26.56	43	67.19	4	6.25	
Severe pain	14	16.47	63	74.12	8	9.41	
Unbearable pain	9	21.95	22	53.66	10	24.39	

Table 4: Prevalence of sleep quality indicators in volunteers with and without orofacial pain

		With pain	Without pain	p-value
Sleep quality indicators	Very unhappy	25 (92.95%)	2 (7.41%)	<0.0001
	Unhappy	34 (72.34%)	13 (27.66%)	
	Neither happy nor unhappy	55 (58.51%)	39 (41.49%)	
	Happy	81 (49.39%)	83 (50.61%)	
	Very happy	24 (35.29%)	44 (64.71%)	

Table 5: Prevalence of negative feelings in volunteers with and without orofacial pain

		With pain	Without pain	p-value
Frequency of negative feelings	Never	25 (11.42%)	38 (21.11%)	0.11
	Sometimes	124 (56.62%)	97 (53.89%)	
	Often	38 (17.35%)	29 (16.11%)	
	Very often	17 (7.76%)	9 (5.00%)	
	Always	15 (6.85%)	7 (3.89%)	

DISCUSSION

Our study describes a general scenario about biopsychosocial characteristics of the general adult population of the city of Bangalore with regard to head, face and neck pain.

Although not having a statistically significant frequency, one may state that OFP isa highly prevalent condition in the studied sample (54.75%). This result has clinical biological importance because more than half the adult population of the city has pain, with predominantly severe (21.30%) and moderate (16.04%) intensity, often daily (41.10%) and lasting for more than six months (91.32%), in addition to being higher than values presented by other studies with different populations[11,22,23].

Females have reported more pain (67%), which is in line with the literature[11,14,24,25,] however without emphasis on age group, education level or economic condition. Several studies have observed variability on pain prevalence in different age groups,

however it is worth stressing that samples were made up of young and elderly people[9,11,14,23], while our sample was made up only of adults. However, other authors have also not identified this association[26]. With regard to social aspects, it is possible to observe in the literature discrepant results of OFP prevalence related to education and economic levels. In this aspect, it is worth highlighting difficulties to define and measure different socioeconomic levels in general, which suggests that such factors have secondary importance for the development of this painful condition[27].

With regard to head, face and neck pain severity, observed prevalence of severe and moderate pain is similar to what was found by other authors[28]. The fact that more than one fifth of the sample has referred severe pain suggests that a considerable portion of adults living in the city have important morbidity associated to OFP. Other aspect rein- forcing such condition is related to pain frequency. Almost half the individuals reporting OFP suffer this condition every day.

Most prevalent pain was headache (36.00%), followed by shoulders (22.5%), face (20.00%), neck (19.25%), teeth (9.50%) and intraoral region (6.00%). Few are the studies investigating head, face and neck pain frequency present in OFP[15,32]. Some of them point to higher prevalence of toothache as compared to joint or facial pain, or burning mouth[6,13,14,26.] However, our study has observed higher prevalence of chronic headache, result also observed by other authors[15,30.] It is possible that the low prevalence of toothache may be associated to preventive measures for the development of tooth decay (major responsible for pulp toothache) carried out in the city, with broad fluoridation of water that reaches homes, in addition to easy access to public dental assistance services specialized in toothache.

The same is not true for the access of the population to specialized head, face and joint pain. The city has 241 health assistance units, however the general academic qualification of dentists and physicians has indicators of theoretical-technical deficiencies in the area of pain[31], making difficult the effective diagnostic and therapeutic practice in the assistance of OFP individuals.

Our results also confirm the association of OFP, especially chronic, and the negative impact on QL functional, social and psychological aspects[6,12-15,22,23,29,33]. Pain has a major impact on QL of people, due to suffering and daily life limitations, which generates severe effects for individuals themselves and also for society, such as high costs of specialized treatment and

hours lost in the productive process[11], as well as sleep quality impairment[34]. Pain intensity was also associated to higher frequency of negative reports on QL level.

Some limitations should be taken into consideration when interpreting the results of this study, which were based on self-reports about pain symptoms, without clinical evaluation of volunteers So, results indicate association between OFP and poor QL perception, although one cannot establish a direct causality relationship between both factors.

CONCLUSION

The study has observed high prevalence of head, face and neck pain in general adult population of the city of Bangalore, predominantly severe to moderate pain, daily frequency and lasting for more than six months. Results point to the need for health policies developed based on explanation, education, prevention and control of pain, which significantly affects QL of the population.

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