Original Article

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PREVALENCE OF PROBABLE CARPEL TUNNEL SYNDROME AMONG DENTISTS

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ABSTRACT:

Aim: To investigate the prevalence and commonly reported symptoms of Carpel Tunnel Syndrome (CTS) among dentists in Riyadh city, Kingdom of Saudi Arabia (KSA).

Materials and Methods: A cross-sectional survey was conducted among dentists in Riyadh city, KSA. A self-assessment questionnaire known as Boston Carpal Tunnel Questionnaire (BCTQ) comprising the Symptom Severity Scale (SSS) and the Functional Status Scale (FSS) was used. The overall result was the calculated mean of all scores. Data analysis was carried out by IBM-SPSS Version 21.0. Relationships between groups were examined using non-parametric tests.

Results : One hundred fifty five dentists responded by completing the questionnaire. The majority of the respondents were female (64.5%) and Saudis (61.3%).The prevalence of probable CTS was 21.3%. A statistically significant relation was observed between age, hours of practice per day, and years of practice with SSS and FSS ($p>0.05$).

Conclusion: The study concludes that the prevalence of CTS in dental professionals is high. Ergonomic and educational interventions could hold a prominent role in the prevention and management of CTS. Further studies are recommended on ergonomic evaluation of working postures and risk factors associated with CTS among dentists.

Keywords: Dentists, Carpel Tunnel Syndrome, Symptom Severity Scale, Functional Status Scale, Boston Carpal Tunnel Questionnaire

INTRODUCTION:

Carpal Tunnel Syndrome (CTS) is an entrapment syndrome caused by the pressure on the median nerve within the carpal tunnel.[1] Repetitiveness of work, forceful exertions, mechanical stress, posture, temperature, and vibration are ergonomic risk factors associated with CTS. These risk factors are present for dentists as contact stress over the carpal tunnel may be caused by dental instruments, and wrists may be held in awkward positions for prolonged periods.[2] Higher rate of hand and finger pain symptoms are seen among dentists than in the general population. This higher rate of pain is associated with dentists who reportedly work longer hours.[3]

Older age, female gender, and increased body mass index (BMI), were shown to have higher risk for CTS.[4-6] Several studies have addressed CTS in the dental profession,[7] in particular dentist.[8] A study conducted on army dental personnel in America indicated that prevalence of CTS is high in army dental personnel 25.4%.[9] Another study concluded that the prevalence of CTS was 16.7% among Isfahanian dentists and it was more common in older

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dentists.[10] The prevalence of probable CTS was 21.2% among government dentists in Kelantan.[11] A study among dental professional in India found the prevalence of CTS to be 20%.[12]

High prevalence of oral health diseases such as caries[13]and periodontal diseases[14] in KSA contributed to the increase in work burden to the dentists in order to fulfill the need and demand of dental services. This situation may lead to higher prevalence of CTS among dentists in KSA. Therefore, the present study aimed towards a better understanding on the magnitude and factors associated with this problem among dentists in this study population. Evidence from this study could be useful to be a baseline data to establish further study and conduct intervention programs for prevention of CTS especially in KSA.

MATERIALS AND METHODS:

A quantitative cross-sectional study was conducted among dentists in Riyadh city, KSA. This study used the Levine questionnaire (Boston questionnaire or Carpel tunnel questionnaire) for the assessment of severity of symptoms and functional status in CTS. It is self-administered and is in two sections. The symptom severity scale (SSS) is eleven questions and evaluates symptoms regarding severity, frequency, time, and kind. The functional status scale (SSS) is eight questions and evaluates how the syndrome affects daily life. The questionnaire also includes the variables such as age, gender, nationality, years of occupation, and hours of practice per day.

The first section, entitled as SSS, checking for: pain severity during day and night times, time of pain during the day, weakness, tingling sensation felt at night, how frequently did that tingling occur and whether there is numbness or not. For each question, five possible answers are numbered from 1 to 5, arranged in an ascending order of symptoms severity. For the second section, entitled as FSS, the listed activities are difficulty in “writing, buttoning clothes, holding a book, gripping the telephone, performing household chores, opening jars, carrying a grocery bag, bathing and dressing.” Each activity has five difficulty degrees.

In the SSS, the overall result is the calculated mean of all 11 scores and the overall score for functional status is calculated as the mean of all eight responses in the FSS. Consent was obtained from all the participants in the study. Ethical approval was obtained prior to the study. Data were entered and analyzed using the Statistical Package for Social Sciences (IBM SPSS Version 21 for Windows). Differences between groups were examined using Mann-Whitney U test. Spearman's rho correlation test was used to assess relationships between SSS and FSS in relation to risk variables. A p value of ≤ 0.05 was considered as statistically significant.

RESULTS:

Table 1 shows the demographic characteristics of the respondents. Of the total of 155 subjects who responded, majority (64.5%) of the dentists was female and 61.3% of them were Saudis. Their mean age was 34.7 years (SD= 6.1). The mean hours of practice per day was 6 hours (SD=2.1) and average years of practice after their dental degree was 8.4 years (SD=6.3). The prevalence of probable CTS among dentists in Riyadh city was 21.3%. Results found that percentage of CTS increases with the age, increasing job or working experience, and hours of practice per day. A higher symptom severity or functional status score indicates worse symptoms or dysfunction.

The comparison of mean values of the SSS and FSS showed statistically significant difference in the mean values of SSS in relation to gender and nationality (Table 2). The mean SSS was significantly higher in female study subjects when compared with male subjects (p=0.001) and the mean SSS was significantly higher in Saudis when compared with non-Saudi subjects (p=0.000). There was a statistically statistically significant correlation between mean SSS and age (p=0.000), years of practice (p=0.000), and hours of practice per day (p=0.019). Similarly there was a statistically significant correlation between mean FSS and age (p=0.044), years of practice (p=0.000), and hours of practice per day (p=0.002) (Table 3).

DISCUSSION:

The aim of this study was to evaluate the prevalence of CTS among the dentists working in Riyadh city using the Boston Carpal Tunnel Questionnaire (BCTQ). The questionnaire is regarded as a valuable assessment of severity of symptoms and functional status in CTS. The SSS evaluates symptoms and FSS evaluates how the syndrome affects daily life. The BCTQ has undergone extensive testing for validity, reliability, and responsiveness for knowing the prevalence of CTS.[15] This may the first study in which the BCTQ instrument is used for exploring the prevalence and association of symptoms of CTS and functional assessment among dentists in Riyadh city, KSA.

In the present study, prevalence of probable CTS among dentists in Riyadh city of 21.3% was higher than previous studies among dentists in Iran, India, Pakistan, and Malaysia.[10-12, 16] In contrast, it was comparatively lower than the studies in Greece and Australia.[17, 18] The difference in the results may be attributed to difference in the methodology. Female gender was found to be more prone to this disease. This predisposition could be due to small wrists and potentially smaller carpel tunnel volume. This disease is more commonly seen in elderly people and women are very much predisposed to this syndrome as compared to men.[19, 20] As expected the frequency of CTS increased with the increasing working hours per day. The results of this study

are in close association with the previous studies.

Even though the cross-sectional design does not permit causal inference, the observed relations give valuable evidence for further research and policy making. This study also used self-administered questionnaire which may contribute to recall bias. Diagnosis of probable CTS in this study was based on the questionnaire which relied on self-reporting. This study was carried out in only one city, and the dentists surveyed may not be representative of all Saudi dentists. Moreover, the prevalence of CTS we are reporting may be under or over estimated. Further studies are needed to confirm the present results with the use of electro diagnostic procedures and hand diagrams.

CONCLUSION

The present study concludes that the prevalence of CTS in dental professionals is high. This had a significant relation to the age, hours of practice per day, and years of practice of the dental professional, when the diagnosis is made using SSS and FSS. Females have higher risk of developing CTS than males. Ergonomic and educational interventions could hold a prominent role in the prevention and management of CTS. Further studies are recommended on ergonomic evaluation of working postures and risk factors associated with CTS among dentists.

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TABLES:

Table 1. Demographic characteristics of study subjects

Gender	Male: n (%)	55 (35.5)
	Female: n (%)	100 (64.5)
Nationality	Saudi: n (%)	95 (61.3)
	Non-Saudi: n (%)	60 (38.7)
Age (years)	Mean (SD)	34.7 (6.1)
Hours of practice (per day)	Mean (SD)	6.0 (2.1)
Years of practice	Mean (SD)	8.4 (6.3)

Table 2. Comparison of mean values of SSS and FSS in relation to gender and nationality

	Mean (SD) SSS	p value	Mean (SD) FSS	p value
Gender				
Male	13.2 (3.2)	0.001*	9.3 (2.3)	0.146
Female	15.3 (6.6)		10.2 (3.9)	
Nationality				
Saudi	15.8 (6.7)	0.000*	9.9 (3.9)	0.006*
Non-Saudi	12.6 (3.0)		9.9 (2.4)	

Table 3. Correlation of SSS and FSS in relation to risk variables

		p value
SSS	***Age (years)***	0.000*
	Hours of practice (per day)	0.019*
	Years of practice	0.000*
FSS	***Age (years)***	0.044*
	Hours of practice (per day)	0.002*
	Years of practice	0.000*