ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Analysis of single or combination of factors causing carpal tunnel syndrome.

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ABSTRACT

To study the various factors and analyze the most common single or combination of factors that cause carpal tunnel syndrome. Patients diagnosed with carpal tunnel syndrome after undergoing electro diagnostic studies were taken up for the study. A total of 72 cases attending orthopedic outpatient department were included, of which 42 were females and 30 were males. Complete history was obtained and clinical examination was done. Laboratory reports and, x-ray report and electro diagnosis report diagnosis of Carpel Tunnel Syndrome (CTS) recorded. Out of 72 cases ,58 cases were type 2 diabetic subjects 60 patients were above the age of 40 and 51 patients were in the obese category with Body Mass Index (BMI) above 30. By sex categorization, CTS is more prevalent among females 42 as against only 30 in males. This study suggests that age above 40as the most common single factor for CTS but number of patients with Type 2 Diabetic Miletus (T2DM), BMI >30 and sex too are complaining high. Hence CTS is caused by combinations of multiple factors such as age>40, T2DM, BMI >30 and female subjects.

Keywords: Carpal tunnel syndrome, DM, gender, BMI

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ISSN: 0975-8585

INTRODUCTION

Carpal tunnel syndrome is an entrapment neuropathy of the median nerve at the carpal tunnel in the wrist [1,2]. CTS accounts for 68% in women and 0.6% in men causing pain, tingling, and numbness in the hand and even radiating to the arm [3]. The most reliable method to diagnose CTS is by electro diagnosis [4]. Epidemiological studies were performed to identify the consistent factor responsible for CTS among other factors like gender, obesity (BMI>30), DM, Rheumatoid arthritis, hypothyroidism [4,6,7]. Risk of CTS increases after the age of 30[4] and very rare below 20 years. Warner et al (1984) found BMI >29, gender and age were all independent risk factor for CTS. Stalling et al (1977) also indentified a high BMI as an independent factor.

This study attempts to analyze the various factors and find out the most common single or combination of multiple factors that cause CTS

MATERIALS AND METHODS

This study was conducted in Madha Medical College and Research Institute after obtaining Institutional ethical committee clearance. Patients attending Orthopedic OPD who are suffering from Carpal tunnel syndrome were taken up for this study. Written consent was obtained from them. A detailed history was taken including age, gender; history of diabetes, hypothyroidism, renal disorders was taken. Preliminary clinical examination was done including anthropometric measurements to calculate BMI. The cases included in the study were termed known case of CTS with the previous reports of electro diagnostic studies with the following criteria or

A. Difference greater than 10m/s between the conduction velocities of the median and ulnar nerves in the palm –wrist segment
B. A difference greater than 0.5m/s between the peak latencies of the palm- wrist segment of the median and ulnar nerve
C. A difference greater than 0.5m/s between the sensory peak latencies of the median and radial nerve
D. Absence of sensory or mixed response of the median nerve
E. A difference greater than 0.4m/s between the distal motor latency (dml) from the median and ulnar nerve to the second lumbrical and interosseous muscles respectively

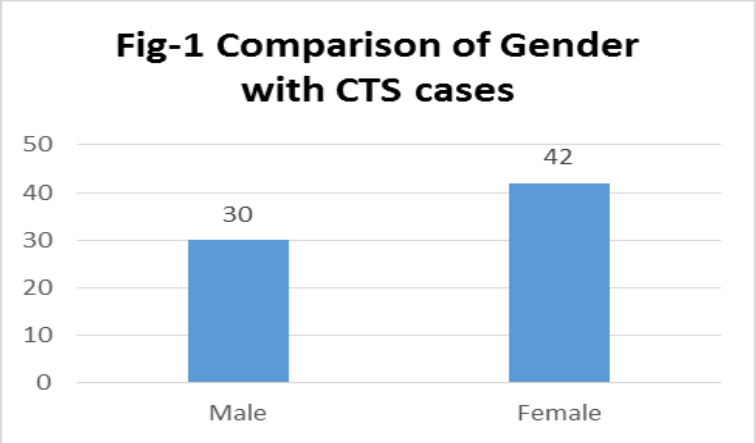
RESULTS

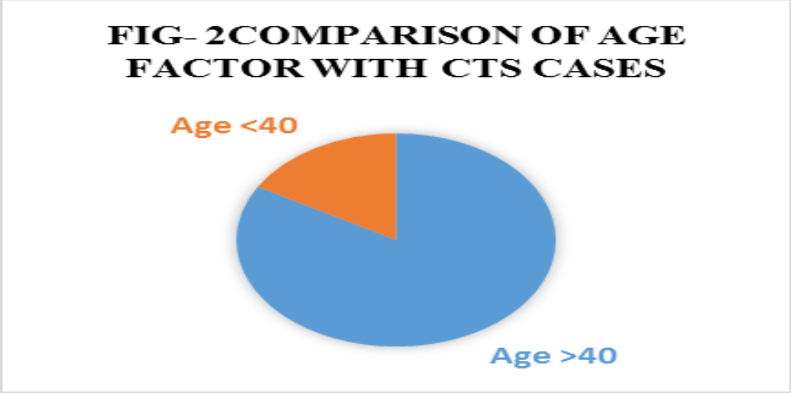
Among the total 72 clinically and by electro diagnostic studies, patients diagnosed with CTS, 42 were female and 30 were males showing female preponderance (Table 1). In total 58 cases were type 2 diabetes subjects proving the association of CTS with diabetes 60 patients were above the age of 40 suggesting the occurrence of CTS in elderly age group. 51 patients were in the obese category with BMI>30 suggesting obese as another factor for causing CTS.

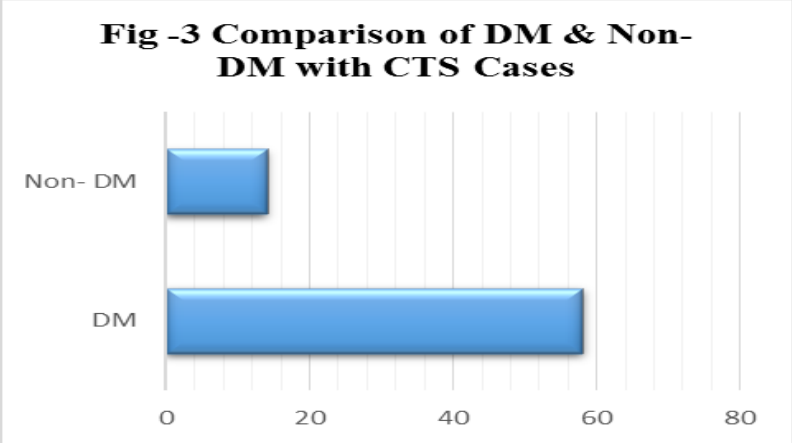
Table 1 - Illustration of factors & its association with percentage of CTS cases

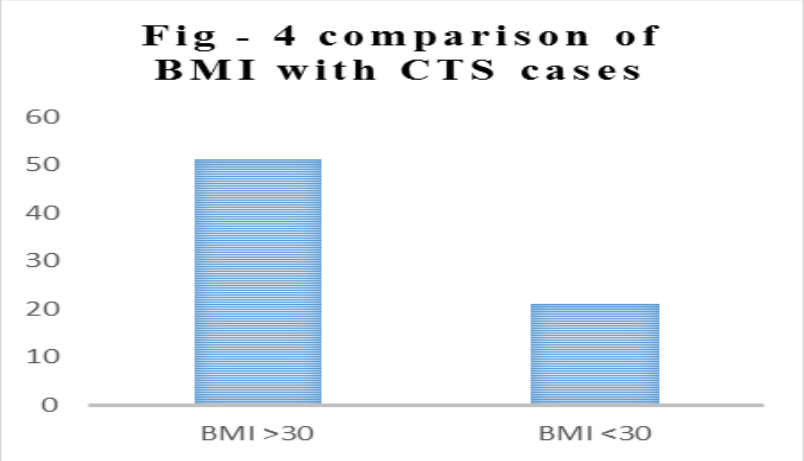
Factors		CTS cases (Total 72)	Percentage %
Gender	Male	30	41%
	Female	42	58%
Age	>40	60	83%
	<40	12	16%
DM		58	80%
Non- DM		14	19%
Obesity	**BMI >30**	51	73%
	BMI <30	21	29%

ISSN: 0975-8585









DISCUSSION

Carpal tunnel syndrome is an entrapment neuropathy of the median nerve at the carpal tunnel in the wrist [1,2]. As per the previous studies, female are more affected by the CTS (Fig1) than males [3]. This study too shows females to be more affected with CTS, a total of 42 females than only 30 affected males. Kouyounmdjian et al supported increased age and obesity as a factor for CTS. This study supports previous studies with the result showing 60 cases of CTS in the age group of more than 40 and only 12 cases in the age group of <40 and total of 51 cases in the obesity category with BMI >30 and only 21 cases in the BMI <30 category supporting the factor (Fig4) that obesity as factor of CTS (Fig 2). Of all the other factor diabetes, another important factor (Fig3) to cause CTS as per this study with 58 cases in T2DM and only 14 cases non-diabetic. Males to have more severe CTS, and DM was a significant risk factor for bilateral lesions. 15 to 20 % of people are reported with DM. Research suggesting the link between diabetes and CTS due to exceptionally with high blood sugar level also found having CTS could be a predictor for developing DM [7,8]. The development of CTS could therefore be indicative of a future DM diagnosis. At Kings College patient with CTS were 36% more likely to be a later diagnosed with Diabetes [10].

CONCLUSIONS

This study confirms that female, obesity, age, and diabetes are independent and strongest risk factors for CTS as supported by other authors [2,5,6]. Hence this study concludes that though each factor imposes high risk, CTS is caused by combinations of multiple factors such as female gender, obesity, elderly age and diabetes.

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