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Research Article

RETROSPECTIVE CLINICODEMOGRAPHIC STUDY OF CARPEL TUNNEL SYNDROME AT A CENTRAL INDIAN SUPERSPECIALITY PRIVATE HOSPITAL

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ABSTRACT

Clinico-epidemiologic evidence was gathered on carpel tunnel syndrome in central Indian patients seeking care at private superspeciality hospital. Retrospective study of clinic-demographic profile of 42 records of diagnosed and treated carpel tunnel syndrome cases at private superspeciality hospital, Nagpur central India was carried out. The clinical severity grading was by nerve conduction estimates. Male to female gender ratio of the victims was around 1:5 and most patients were around 50 year age. Over 3/4th of patients had bilateral disorder. Diabetes mellitus was commonest comorbidity afflicting over third of patients and hypothyroidism in about tenth of victims. Most cases could be managed conservatively with surgical decompression necessitated in 4 (under 10 percent) cases. Study findings emphasize address to obesity, diabetes hypothyroidism, food and lifestyle for prevention and also abetment of carpel tunnel syndrome, in studied central India region.

Keywords: Carpel tunnel syndrome, Diabetes mellitus, Median nerve, Nerve conduction studies.

INTRODUCTION

Carpel tunnel syndrome(CTS) is very common compressive peripheral neuropathy of upper extremity and believed to afflict over 1 to 5% of general population in later decades of life^{1,2}. It is also widely recognized occupational health condition in industrial workers doing high force repetitive wrist activity in awkward position as well as using vibratory tools³. Diagnostic features are sensory loss along lateral aspect of hand, motor weakness and wasting of abductor pollicis brevis muscle. Typical Tinels and Phalens signs^{4,6}, are elicited at wrist. Definitive test is nerve conduction study^{7,8}. Congenitally narrow carpel tunnel, acquired joint deformity or space occupying pathology are mechanical etiologies relevant to the syndrome. Other factors as work stress and trauma of hand, endocrine disorders, fluid retention are recognized to contribute to pathogenesis⁹⁻¹¹. Present study attempts to elicit local clinical evidence base on carpel tunnel syndrome, by retrospective analysis of clinic-demographic characteristics in cases treated between January 2003 to April 2004 at CIIMS superspeciality private hospital in Nagpur Central India.

PATIENTS AND METHODS

Patient files were examined with focus on carpel tunnel syndrome as primary diagnosis. Details of age, gender, occupation, side/s affected; neurophysiological grade as mild,

moderate, severe or very severe and comorbid associations were collected.

Symptoms included parasthesia, pain and weakness in median nerve distribution area. The suffering was marked particularly in night in most patients. The neurophysiological grades were based on nerve conduction study¹². Thus, Mild CTS implied prolonged distal sensory peak latency with or without decreased sensory amplitude; Moderate CTS implied abnormal median sensory peak latency, Severe CTS implied prolonged motor and sensory distal peak latency, either with a low or absent sensory nerve action potential or compound muscle action potential; Very Severe CTS implied absent thenar motor or sensory responses, either with a present or absent lumbrical response.

Motor and sensory nerve conduction study(NCS) of median nerve¹³, was done mostly in both hands unless patient declined. Ambient temperature was maintained above 32 degrees C during testing procedures. Motor nerve conductance testing involved stimulation of median nerve 6.5 CM proximal to the active recording electrode. Sensory conduction were studied by obtaining responses at 2nd and 5th digits for median nerve by antidromic stimulation at 13CM and 11CM respectively. The laboratory specific normative value for median motor latency was less than 4.5 milli seconds. The normative value for median sensory distal peak latency was less than 3.5 milli seconds.

The difference in sensory peak latency of less than 0.4 milli seconds was taken as significant. The difference of latency was measured at digit 4th for median sensory nerve. It was measured at wrist at a distance of 14CM. Difference of more than 0.4 milli seconds in peak latency was taken as significant. In cases with bilateral CTS, neurophysiological grade was that more severe among two sides. The patients name and identities were excluded from collection as per ethical committee of hospital, advice. The categorical values are provided as percentage.

OBSERVATIONS AND RESULTS

A total of 42 case records were obtained with necessary record of information. 35 were females and 7 males. Total 74 hands nerve conduction data were available. Average age in females was 51.8 years and in males 55.1 years. Bilateral affliction predominated and 28 of 35 women (80%) and 5 of 7 men (71%) had bilateral CTS. Type 2 Diabetes was established in 16 of the 35 women patients (45.7%) and 3 of 7 men (43%). Also hypothyroidism was diagnosed in 6 women (17%) and 1 man (14%). No other significant morbidity was discerned.

Table 1: Distribution of gender wise occupation profile of patients

Occupation	Males (n=7)	Females (n=35)
Household	0	20 (47.6%)
Shopkeeper	4	2
Office clerk	1	10 (23.8%)
Teacher	0	3
Driver	1	0
Mechanic	1	0

Table 2: Disease severity pattern in the cases were as under

CTS grade	Right hand n(%)	Left hand n(%)
Mild	20 (50)	19 (56)
Moderate	18 (45)	12 (35.5)
Severe	1 (2.5)	2 (6)
Very severe	1 (2.5)	1 (3)
Total (hands)	40 (100)	34 (100)

Table 3: Profile of Uni or bilateral CTS in two genders

Gender	Unilateral n(%)	Bilateral n(%)
Male	3 (43)	4 (57)
Female	7 (20)	28 (80)

DISCUSSION

Carpel tunnel syndrome (CTS) diagnosis was based on clinical symptoms, signs and neurologic examination. Nerve conduction studies (NCS) both confirmed diagnoses and helped grading of severity. All the patients were documented of delayed sensory conduction velocity of median nerve. More or less this agrees with literature¹⁴. Magnetic resonance imaging was not done as diagnostic aid¹⁵, in any case. As is obvious, most cases were in their 50s and there is 5:1 preponderance of female victims of CTS. This is in agreement with reported pattern¹⁶. Among all, women doing household

work constituted 47.6% and both men and women working as office clerks 26.2% of the cases. These involve much of repetitive wrist activity. One person each were driver and mechanic with more of wrist use. The proposed role of occupation appears to be held in this study also¹⁷. It is also however sedentary life that dominated in all except 2 cases, eg. in 95%. Multiple risk factors intrinsic to the individuals are understood to be etiologically influential. Thus sedentary life style, obesity, wrong food habits, tobacco, alcohol habits are have been suspect as causal^{18,19}. Diabetes mellitus comorbidity associated with 19 of 42 (45%) studied CTS cases. Next comorbidity was hypothyroidism seen in 7 of 42 (16.5%) cases. Other Asian studies have also documented Diabetes mellitus as singularly the most frequent comorbidity in CTS and also frequent finding of hypothyroidism²⁰⁻²². Similarly in agreement is high bilateral occurrence of the disorder eg. in 76% of cases.

Popular pathophysiological theories of CTS include mechanical compression of median nerve in carpal tunnel²³, vibration induced nerve injury²⁴, and microvascular insufficiency of nerves^{25,26}. There is demonstrated increase of oxidative stress and variety of inflammatory mediators at site of nerve involvement²⁷. Most (38 of 42) patients were conservatively managed to discharge. Only 4 (less than 10%) were subject to surgical decompression.

Conservative treatment besides finger splint and carpal bone mobilization involves systemic glucocorticosteroid anti-inflammatory therapy prominently²⁸. Some people draw good therapeutic response with intraneural steroid injection also. The success of conservative management in our largely mild to moderate severity CTS cases, points to primacy of vascular insufficiency and inflammatory etiology. High diabetes prevalence should promote inflammatory state besides overactive adipose tissue in overweight patients^{29,30}.

Surgical therapy may be needed in severe cases with an alternative option of using local steroid injection³¹. The surgical remediation offered was open carpal tunnel release standard procedure³². No patient was given intraneural steroid, although as good outcomes as surgery have been reported for the strategy^{33,34}. There are instructions on safe sites for injection avoiding injury to the median nerve³⁵.

CONCLUSION

The findings of study emphasize need for keen address to predisposing factors eg. dietary habits, physical inactivity, obesity, diabetes and thyroid disorder as important to both prevention and abatement of CTS. Majority cases bearing mild to moderate CTS may be satisfactorily managed with conservative systemic steroid management. In severe cases intraneural steroid injection as alternative to surgery may need better evaluation, as also the role of magnetic resonance imaging for diagnostic assessment.

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