CLINICAL PROFILE OF PATIENTS WITH CARPAL TUNNEL SYNDROME

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ABSTRACT:

OBJECTIVE: To determine the clinical features and demography of patients with carpal tunnel syndrome (CTS).

METHODS: This descriptive cross-sectional study was done on 250 (210 females and 40 males) patients in Neurosurgery Department, Naseer Teaching Hospital, Peshawar from 1st January 2015 to 31st December 2016. All patients with ≥1 clinical feature of median nerve compression at carpal tunnel level were included while patients who underwent any type of intervention of the median nerve at carpal tunnel level and those with known neurological disorder were excluded. Patients were reviewed for epidemiological data including age, gender, symptomatic side, dominance and neurophysiological grades according to American Association of Electrodiagnostic Medication. Data was analyzed by using SPSS version 20.

RESULTS: Female to male ratio was 5.2:1. Mean age was 48.5±2.54 years in females and 50.5±5.85 years in males. CTS was most commonly seen in the age group of 46-60 years. Bilaterality was seen in 222 (88%). Mild form of CTS was the most common (n=126; 50.4%) followed by moderate (n=120; 48%), severe and very severe in only 1.6% of patients. Most frequent sensory symptoms observed were paraesthesia in 250 (100%), weakness in thenar eminence in 230 (92%), nocturnal pain in 225 (90%), pain after physical activity in 212(85%) cases. Common co-morbidities were diabetes in 80 (32%) and hypothyroidism in 35 (12%) cases.

CONCLUSION: Predominant age group was 46-60 years with female predominance. Bilaterality with sensory symptoms like paraesthedias, weakness at thenar eminences, nocturnal and daytime pain were commonly observed.

KEY WORDS: Carpal Tunnel Syndrome (MeSH); Demography (MeSH), Entrapment Neuropathy, Carpal Tunnel (MeSH); Nerve Compression Syndromes (MeSH).

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INTRODUCTION

The commonest form of median nerve entrapment is carpal tunnel syndrome (CTS)[1-6] and attributes to 90% of all entrapment neuropathies.[7] It was first described by Paget in 1854,[8] and is defined as a mononeuropathy due to a compressive force distorting the carpal tunnel,[9] in 3.8% of the general population.[10] Incidence is up to 276:100,000 per year,[11] with a prevalence of 9.2% in females and 6% in males[12] with a peak age incidence of 40 to 60 years.[13] Factors which contribute in its causation are congenital predisposition, heavy work, injury, fluid retention and the development of any mass lesions in the tunnel.[14,15]

The troublesome features are caused by compression of the median nerve along the carpal tunnel, which is formed on the its three sides by the carpal bones and on the volar surface by the deep transverse carpal ligaments.[16] Main features of carpal tunnel syndrome include pain in the hand, tingling sensation, numbness in the distribution of the median nerve (thumb, index, middle finger and the lateral side of the ring finger),[17] weakness of the grip strength and reduced functional capacity of the affected hand.[18] Patients are more distressed at night, and complain of clumsiness with activities requiring wrist flexion.[19] Patients often describe the 'flick sign' in which shaking their wrists relieves symptoms.[20] Other signs are Tinnel sign, caused by digital percussion to the regions of carpal tunnel and flexor retinaculum, and in Phanel test, there will be paraesthesia in the median nerve innervating area after wrist flexion for 30-120 seconds.[21]

The nerve conduction study is certainly a diagnostic tool for carpal tunnel syndrome.[22,23] The treatment for carpal tunnel syndrome is either surgical or medical. Surgical treatment is generally recommended for those with severe symptoms, while medical treatments are recommended for those who have mild symptoms or in whom the contraindications limit surgery.[24] Examples of conservative treatment include oral and injectable steroids, physical therapy, electrotherapy, night splinting and workplace alteration.[25]

The aim of this study was to determine the clinical features and demography of carpal tunnel syndrome cases attending a tertiary care hospital. It emphasizes the health care providers at governmental and non-government level to plan preventive initiatives and management strategies in the light of local and international past and latest scientific research findings and updates.

METHODS

This descriptive cross-sectional study was conducted at Neurosurgery Department, Naseer Teaching Hospital,

TABLE I: DEMOGRAPHICAL PROFILE OF PATIENTS WITH CARPAL TUNNEL SYNDROME (n=250)

Demographic variables		Frequency	Percentage
Gender (n=250)	Female	210	84
	Male	40	16
Age Group in years (n=250)	15-30 years	10	4
	31-45 years	85	34
	46-60 years	93	37.2
	>60 years	62	24.8
Laterality (n=250)	Bilateral	222	88.8
	Unilateral	28	11.2
	Left	8/28	29
	Right	20/28	71

Peshawar from 1st January 2015 to 31st December 2016. Sample size was 250 and sampling technique was consecutive (non-probability) sampling. Approval was obtained from hospital ethical committee. Inclusion criteria were patients with one or more clinical feature of median nerve compression at level of carpal tunnel. Exclusion criteria was patients who have underwent any type of intervention of the median nerve at the carpal tunnel level and those with known neurological disorder.

Patients were reviewed for epidemiological data including age, gender, symptomatic side, dominance, neurophysiological grades i.e. mild, moderate, severe and very severe according to American Association of Electrodiagnostic Medication. The patients were divided into four different age groups 15-30 years, 31-45 years, 46-60 years and >60 years. Neurophysiological grades were defined as:

(a) *Mild CTS:* prolonged distal sensory peak latency with reduced sensory amplitude

(b) *Moderate CTS:* abnormal median sensory peak latencies with prolongation of the distal motor latency

(c) *Severe CTS:* prolonged motor and sensory distal peak latency with absent sensory nerve action potential

(d) *Very severe CTS:* absent thenar motor or sensory response either with a present or absent lumbrical response[26]

Data was analyzed by using SPSS 20.0 and descriptive analysis was done. Categorical data was analyzed in form of percentages and presented in form of tables.

RESULTS

A total of 250 patients including 210 females and 40 males were included in the study. A mean age of 48.5±2.54 years was found in females and 50.5±5.85 years was observed in males. The female to male ratio was 5.2:1 and this disorder was most commonly seen in the age group 46-60 years. Bilaterality of this disorder was seen in 222 (88.8%) subjects (Table I). Out of 222 patients with bilateral CTS pattern, 192 (86.48%) were females and 30 (13.5%) were males. Similarly, out of 28 unilateral CTS 18 (64.28%) were females and 10 (35.7%) were males.

Mild form of CTS was the commonest form noticed in 126 (50.4%) of subjects, followed by moderate form (Table II).

Paraesthesia was the most prevalent symptom, being present in 100% cases followed by weakness at thenar eminances in 230 (92%), nocturnal pain 225 (90%) and daytime pain in 212 (85%). Majority of cases had ≥1 symptoms of median nerve compression at the carpal tunnel level as seen in 232 (93%) patients (Table III).

Co-morbidities were found in form of diabetes which was the most frequent disorder, found in 80 (32%) cases, followed by hypothyroidism which was observed in 35 (12%) cases while 3 (1.2%) patients were pregnant.

DISCUSSION

Carpal tunnel syndrome is the commonest form of mononeuropathy diagnosed on the basis of clinical features and nerve conduction studies.[26,27] According to a study conducted at London 1:1000 people are diagnosed each year with CTS.[28]

In our study, the higher predominance of CTS is in women with a ratio of 5.2:1 which is close to that of other studies where this ratio was observed to be 5.6:1, 5.4:1, 5:1 and 4.9:1.[16,29-32] Saboor A, et al. in their study at Ayub Teaching Hospital, Abbottabad observed that female gender was in predominanace with 86.3% study population being women.[33] Mean age of CTS subjects in our study was found to be 48.5 years in females and 50.5 years in males with peak incidence in the age group of 46-60 years. Malibary HM, et al. in their study conducted at Jeddah, Saudi Arabia recruited 336 subjects and observed the mean age in females was 52.4 years and 48.5 years in males.[32] Likewise Abumunaser LA, et al. in their study concluded the mean age in females to be 45.5 years and 48.5 years in males [34] which is much closer to our results.

Regarding the laterality, Malibary HM, et al. in 2013 observed that 90.5% of their patients had bilateral CTS, this figure is observed to be 88.8% in our study. Similarly, 11.2% of our cases had unilateral CTS whereas it was reported as 9.5% in the same study.[32]

Paraesthesias was the most prevalent symptom, as it was observed in all of our cases, followed by weakness in thenar eminence which was seen in 92% of our subjects. These figures were observed as almost same with paraesthesias in all and weakness in same number of subjects by Azevedo JWV, et al.[21] Likewise sleeping disorder was

TABLE II: CATEGORIZATION OF CASES WITH CARPAL TUNNEL SYNDROME (n=250)

Category	Frequency	Percentage
Mild	126	50.4
Moderate	120	48
Severe	1	0.4
Very severe	3	1.2
Total	250	100

TABLE III: CLINICAL FEATURES OF PATIENTS WITH CARPAL TUNNEL SYNDROME (n=250)

Clinical Feature	Frequency	Percentage
Paraesthesia	250	100
Weakness in thenar eminence	230	92
Nocturnal pain	225	90
Pain after physical activity	212	85
Radiation of pain to upper limb	175	70
Sleeping disorder secondary to symptoms	162	65

** Single patient can have more than one clinical feature.

observed in 60% of their subjects and seen in 65% of our subjects.

Limitation of our study was confinement to demographic profile with CTS category and pattern. It has the importance in the context of comparing the consistency of our findings with those of other studies, to build a strong evidence of epidemiology, demographic and clinical profile of this disease.

CONCLUSION

In our study, predominant age group was 46-60 years with female predominance. Bilaterality with sensory symptoms like paraesthedias, weakness at thenar eminences, nocturnal and daytime pain were commonly observed.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

SA: Concept & study design, acquisition, analysis & interpretation of data, final approval of the version to be published.

MQ: Analysis & interpretation of data, drafting the manuscript, critical review, final approval of the version to be published.

MU: Drafting the manuscript, critical review, final approval of the version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest

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