

Clinical profile of Carpal Tunnel Syndrome in Oman

Jacob P. Chacko, MD, DM, Ranganath P. Chand, DM, FRCP, Srinivas Bulusu, Bsc, PGD, John J. Tharakan, MD, DM

ABSTRACT

Objectives: Carpal Tunnel Syndrome is the most common entrapment neuropathy with a reported incidence of 7 to 16% of the general population in Western studies. Since this has not been well studied in the Arabian peninsula, we studied 100 patients with Carpal Tunnel Syndrome.

Methods: We studied 100 Omani patients with Carpal Tunnel Syndrome in our clinic. After clinical evaluation the diagnosis was confirmed by motor and sensory nerve conduction studies of the median and ulnar nerves.

Results: There were 15 males and 85 females. No systemic cause was identified in the majority of the

patients. Involvement was unilateral in 23 patients and bilateral in 77 patients.

Conclusion: Carpal Tunnel Syndrome is common in Oman and can be easily diagnosed by clinical examination and nerve conduction studies. We found that the sensory symptoms often transgressed the median nerve distribution and tended to be bilateral for both sexes, with predominance for females.

Keywords: Carpal Tunnel Syndrome, nerve conduction study.

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The Carpal Tunnel is a well-defined anatomic space in the proximal palm that serves as semi-rigid conduit for the passage of the median nerve and the 9 digital flexor tendons from the forearm into the palm. Carpal Tunnel Syndrome (CTS) is defined as compression of the median nerve in this tunnel and is a common entrapment neuropathy. The prevalence varies from 7 to 16% in the United Kingdom.¹ The clinical features are quite variable,² hence we studied the clinical and electrophysiological features of ethnic Omani patients presenting with this syndrome.

Methods. We studied 100 Omani patients referred to us with symptoms, suggestive of CTS. We assessed their symptoms, presence of any associated medical illness, injury to the region, occupation and the presence of similar symptoms in other family members. We examined the motor and

sensory functions of the median nerve and performed Tinel's test (percussion of the median nerve to induce symptoms) and Phalen's test (passive extreme flexion of the palms to induce symptoms within a minute). Nerve conduction study was performed on a Nicolet Viking™ IV machine in a room with a temperature of 25°C. For motor nerve conduction studies, the filter settings were 2Hz (LFF) and 10 kHz (HFF) with a sensitivity of 5 mV. The nerve was stimulated antidromically with a voltage gated stimulator until a constant amplitude Compound Motor Action Potential was obtained consistently. The sensory nerve conduction study was performed with filter settings of 20 Hz (LFF) and 3 kHz (HFF) with a sensitivity of 20uV, ring electrodes were applied on digit III and orthodromically stimulated using a voltage gated stimulus. Sensory Nerve Action Potential was recorded from surface

From the Department of Medicine (Chacko, Chand, Tharakan) and Department of Clinical Physiology (Bulusu), Sultan Qaboos University, PO Box 35, Muscat, Sultanate of Oman.

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Address correspondence and reprint request to: Dr. Jacob P. Chacko, PO Box 35, Al Khod 123, Muscat, Sultanate of Oman. Tel. +968 513150. E-mail: jacobpc@omantel.net.om

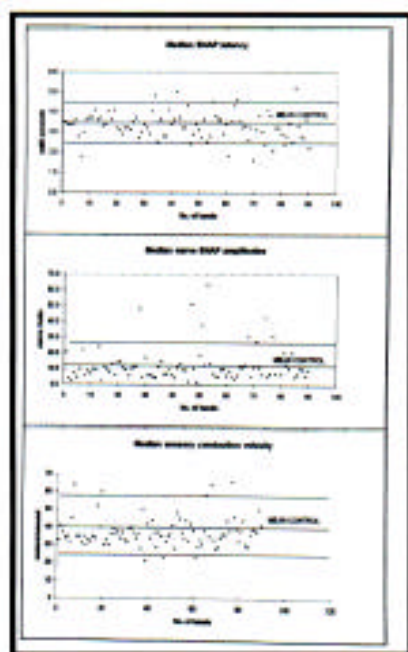


Figure 1 - Scatter diagram showing sensory conduction values of the median nerves in Carpal Tunnel Syndrome along with mean control $\pm 2SD$.

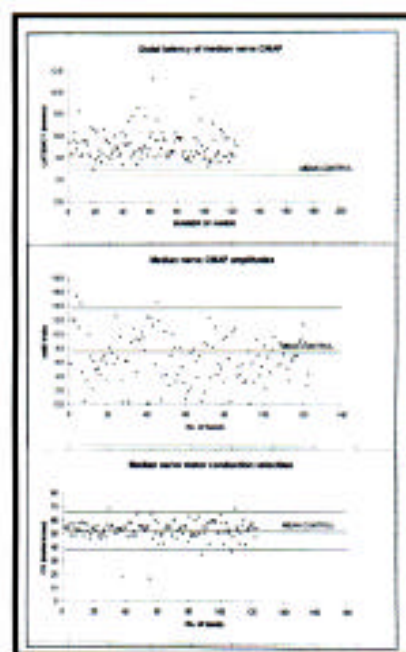


Figure 2 - Scatter diagram showing motor conduction values of the median nerves in Carpal Tunnel Syndrome along with control value $\pm 2SD$.

electrodes placed on the wrist over the median nerve with an interelectrode distance of 3 cm. The parameters measured were distal motor latency, amplitude and conduction velocity of median and ulnar nerves. Sensory Nerve Action Potentials (SNAP) were recorded orthodromically by stimulating digit III. We measured the absolute latency, amplitude and conduction velocity. These findings were compared with the established normative data of our laboratory in 30 healthy controls. Of the 85 females and 15 males tested, 79% were housewives, 17% were clerks and 4% were from other professions. We identified an underlying cause only in 8 patients. They were as follows: Tenosynovitis - 1, Rheumatoid arthritis - 2, Diabetes Mellitus - 2, Arteriovenous fistula for hemodialysis - 1. Their ages ranged from 22-73 years (mean : 41). Involvement was unilateral in 23 patients and bilateral in 77 patients. In patients with unilateral CTS the right hand was affected in 15 subjects and the left hand in 7 subjects. We compared the nerve conduction values of subjects with and without Tinel's sign and with and without Phalen's sign.

Results. Of the 177 involved limbs, presenting symptoms were paresthesia in 137, pain in 133, weakness in 100 and numbness in 99 hands. The distribution of sensory symptoms involved the median territory in 46%, whole hand in 29%, forearm in 15% and arm in 10%. Sensory loss was

present in 54 hands, wasting in 64 and weakness in 100 hands. Tinel's sign was positive in 93 hands and Phalen's sign in 62 hands. Median nerve sensory and motor conduction velocities (when it was possible to stimulate the nerve) are shown in Figures 1 and 2 along with the mean control values of $\pm 2SD$. These values show that the diagnosis of CTS is based on a combination of clinical and electrophysiological features and the distal latency is the most useful among these. There was no correlation between Tinel's sign and Phalen's sign with any of the 6 nerve conduction parameters - sensory conduction velocity, sensory nerve action potential amplitude and latency, motor conduction velocity, compound motor action potential distal latency and amplitude.

Discussion. Carpal Tunnel Syndrome is common among females in Oman with a Female/Male ratio of 5.6 in our study. In a recent study of 95 patients from Saudi Arabia the Female/Male ratio was 3.3.² Mean age of our patients was 41 which is comparable to other studies in the region (Saudi Arabia : 40). Most of our female patients were housewives and male patients were clerks. Carpal Tunnel Syndrome is more common in workers engaged in repetitive activities that involve flexion and extension of the wrist, strong grip or exposure to vibration.³ We think, excessive wrist movement may be responsible for the high prevalence of the syndrome in housewives and clerks and for the

tendency of the right hand to be more frequently involved in our study. Even though many diseases of the joints and endocrine abnormalities are listed among the causes, these are rare in our group of patients. The distribution of the sensory symptoms is not always in the distribution of the median nerve. Poor localization of the pain and paresthesias may be responsible for the symptoms of the whole hand being involved, which is a common symptom seen in 29% in our series. In contrast to the sensory symptoms, the motor symptoms were localized to the muscles innervated by the median nerve. The occurrence of Tinel's sign and Phalen's sign in our patients is comparable to that reported by others in the literature.⁴ In the electrophysiological analysis, no single test was consistently abnormal. Prolongation of the distal latency of the median

nerve and low amplitude of the Sensory Nerve Action Potential were the most common findings in our study.

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