

Clinical and Electroneuromyographic Aspects of Carpal Tunnel Syndromes Seen in the Neurology Department Chun Fann Dakar

Lemahafaka Jemissair Glorien^{1*}, Razafindrasata Ratsitohara Santatra², Rajaonarison Lala Andriamasinavalona³, Marième Soda Diop-Sene¹, Lala Bouna Seck¹ and Amadou Gallo Diop¹

¹Service Neurologie, CHUN Fann, Dakar, Sénégal

²Service Neurologie, CHU Morafeno, Toamasina, Madagascar

³Service Neurologie, CHU Place Kabary, Antsiranana, Madagascar

*Corresponding Author: Lemahafaka Jemissair Glorien, Service Neurologie, CHUN Fann, Dakar, Sénégal.

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Abstract

Introduction: Carpal tunnel syndrome is the most common of the upper extremity canal syndromes. It is secondary to compression or irritation of the median nerve within the carpal tunnel. Our aim was to describe the clinical and electroneuromyographic characteristics of patients seen for carpal tunnel syndrome at the Neurophysiology unit at the neurology department, CHUN Fann Dakar.

Methods: This is a retrospective and descriptive study which took place over a period of one year from January 2019 to December 2019 in the neurology department, CHUN Fann Dakar.

Results: During the study period, the neurophysiology unit at the neurology department, CHU Fann Dakar had carried out 1750 ENMG exams. From these files, we retained 37 files of patients who met the inclusion and exclusion criteria, or 2.11% of patients admitted for an ENMG examination. The average age was 53 years old. The female dominance was noted in our study population with a sex ratio of 0.3. The main manifestations were pain and/or acroparesthesia of more annoying or painful intensity, especially at night (35%). At the ENMG, we found mainly sensory-motor impairment (60%) and axonal type (49%).

Conclusion: The ENMG is of capital importance during carpal tunnel syndrome, it makes it possible to confirm the clinico-electrophysiological correlation, to study the type of lesion and the severity of the nerve damage.

Keywords: Compression; Median Nerve; Clinical; ENMG

Introduction

Carpal tunnel syndrome (CCS) corresponds to all clinical manifestations secondary to a compressive neuropathy of the median nerve, at the level of the osteofibrous parade that constitutes the carpal tunnel [1,2]. Physiologically it is characterized by an increase in pressure at this level which results in ischemia of the median nerve and is gene nerve conduction [3,4]. In the majority of cases, no etiology of CSC is identified, referred to as the idiopathic form. However, any condition that reduces the ratio of contents to content inside the carpal tunnel can cause compression of the median nerve and become symptomatic. This pathology can lead to a functional or professional disability, hence the interest of early diagnosis and good therapeutic management.

Electroneuromyography (ENMG) is a medical technique that studies the peripheral nervous system to study the electrical activity of nerves and muscles. It is the only objective examination of median nerve function, however the need for this examination to make the diagnosis of CSC remains controversial. The electromyogram eliminates other diagnoses and allows to appreciate the severity of distal neuropathy.

Aim of the Study

Hence this study which aims to describe the clinical manifestations and the results of the electronic epinomographic examinations carried out for carpal tunnel syndrome seen in the neurophysiology unit, neurology department of the National Hospital Center Fann Dakar.

Methods

This is a retrospective and descriptive study that took place over a one-year period from January 2019 to December 2019. Included were all patients seen for an ENMG examination whose final diagnosis is carpal tunnel syndrome. The sensitive and motor conduction speed measurement was performed in all patients to diagnose demyelinating impairment supplemented by detection in the event of axonal impairment. The device used was Micromedbrand® which is internationally recognized in neurophysiology. Demyelinating impairment was confirmed by slower conduction speed, lengthening of dissenting latency, and axonal impairment by decreased amplitude or lack of excitability of the nerves examined. The examination was performed on the median nerve by performing on the motor and sensory contingent. In this study, patients were taken only in one of the two ENMG devices available at the Neurophysiology unit because the normative values are different on the two devices (Synergy Nedelec and Micromed). On the other hand, patients whose clinical correlation and ENMG were not established were excluded. The data was processed using Excel software.

Results

During this study period, we registered 1,750 patients for ENMG examination on the Micromed device. Among these patients, we collected 82 patients admitted for carpal tunnel syndrome as an indication of examination. We then removed 45 patients whose normal ENMG or in favor of other etiologies (root damage, ulnar nerve compression) and without clinical-electric correlation. A total of 37 patients selected in this study represent 2.11% of patients seen for an electroneuromyographic examination. The average age is 53 years with an extreme of 27 and 80 years, the age group most affected is between 60 and 70 years. We have a female predominance in our study population (male 9 and female 28) with sex ratio at 0.3. In 59% of the cases, our patients lived in urban areas (n-22) and mainly concerned secretaries in the majority in 18% (n -7). The reason for the ENMG examination request was painful manifestations in 35% (n -13) of bilateral location at the territory level of the median nerve in 51% (n -19) and sensitivo-motor type in 60%. At ENMG, the axonal lesion constitutes the 48.65% of the nerve damage seen in patients with CSC (n-18).

Discussion

The objective of this study is to determine the clinical and electronic economic characteristics of patients seen for an ENMG examination and in favour of carpal tunnel syndrome. 37 patients were selected in this study, with a prevalence of 2.11%. This result is not representative of the reality on the epidemiology of carpal tunnel syndrome in our department as ENMG examinations were taken in this study only in the Micromed device. In the literature, epidemiological data vary. The prevalence in the general population of clinical diagnosed AND confirmed CSC by electrophysiological study is 2.7% (2.1% - 3.4%) [6]. Other authors point out that carpal tunnel syndrome is the most common of ductal syndromes in the upper limb, and one of the most common reasons for consultation in hand surgery [7]. Its annual incidence in the general population is constantly increasing and has been estimated at about 300/100,000. In France 80,000 surgeries for carpal tunnel syndrome are performed each year [7,8]. In Lomé, CSC accounts for 0.6% of outpatient consultations in the rheumatology department [5]. The difference in these studies could be explained by the different methodology and place of study in the surgical environment, the rheumatology department, neurophysiology and the general population.

The most affected age group is between 60 and 70 years old with an extreme age of 27 to 80 years.

The average age was 53. Our average age is similar to those found in the literature, this confirms the idea of some authors who have described CSC as a common condition during the 5th decade. Other authors argue that age between 40 and 60 is a risk factor for CSC because it is the professionally active age. There were two frequency peaks, the first and the highest between 45 and 59 years and the second between 75 and 84 years [7,8].

There is a female predominance in our study population (male - 9 and female 28) with sex ratio at 0.3. All authors, with rare exceptions, find a clear female predominance [2,9,10]. Women are more exposed because of hormonal changes (menopause, pregnancy). Hormones will change the volume of tendons, which will then enlarge and further compress the median nerve. This can be explained by the fact that estrogen deficiency leads to local vasomotor disorders with stasis and edema, eventually fibrosis of the sheaths of the flexed tendons [6]. Other author suggested that age at menopause may be a significant factor in the development of CSC. Hormonal changes in pregnancy can have long-term effects that increase the incidence of CCS in postmenopausal years. It showed that women with CSC experienced menopause at a younger age and that there is a strong and significant positive correlation between the duration of CSC and menopause [9]. A study on CSC found in their control case study of 791 CSC a strong and independent association of the risk of CCS occurrence with the female sex, especially outside of any obesity; this risk was further increased in the case of diabetes. CSC was more severe in male patients, but a later consultation with the same symptoms cannot be ruled out [11].

In 59% of the cases, our patients lived in urban areas (n -22). The predominance of patients lies in the urban environment in our study, it is a reflection of the distribution of the overall population following rural exodus in our country in addition to the place of recruitment of this study is in urban areas. The predominance of patients from the urban environment could be explained by the proximity of his residence and the place of study also the accessibility of patients.

Although the clinic is rich, the specificity of this clinical examination is questioned by many authors who prefer to use ENMG examinations, either systematically or in cases of diagnostic doubt [17]. Our patients have mostly painful manifestations in 35% of cases (n -13). CSC can cause several problems the symptomatology is most often typical, but the provocative tests are not always demonstrative. The appearance is usually progressive, the acute form is very rare. Complaints during carpal tunnel syndrome are synonymous with nocturnal paroxysmal acroparesthesia. He mostly complains of pain, acroparesthesia, tingling and tingling. Pain and acroparesthesia are on the rise at night, and more precisely in the second part of the night. This symptomatology can also occur during the day during repetitive movements of daily life [12,13]. Apart from subjective signs, the objective signs are mostly late. You may have the nasal atrophy with a disorder of the thumb avulsion. At this stage, motor impairment coexists with sensitivity disorders hindering fine activities (buttoning, sewing) [14]. In the Clinic, there are provocative tests that allow to have or awaken symptomatology of compression of the median nerve. Classic provocation tests such as Phalen, Tinel, or Durkan tests. The latter, which consists of reproducing the symptoms by direct compression on the median nerve, with the examiner's thumbs, for 30 seconds, seems to be the most sensitive and the most specific Tinel sign [15,16].

The location of bilateral CSC in 51% of patients. This suggests an idiopathic etiology unrelated to their professional activities. In the literature, the incidence of bilateral CSC ranges from 5.2% to 80%, and the incidence of unilateral impairment ranges from 4% to 94.8% [6,14].

The sensitivo-motor impairment predominates in 60% of the affected fibers. In the past, sensitive impairment predominates in 77% of cases. This could be explained by the degree of compression of the median nerve that affects the motor and sensory contingent. The impairment may initially affect on the motor or sensory side of the median nerve, but in the long run the sensory-motor impairment is installed by extension of the nerve compression [5].

Axonal lesion is the majority of the nerve lesion seen in patients with CCS (n-18). We can say that our patients arrive for a late-stage ENMG examination. The detection examination is less sensitive by later detecting carpal tunnel syndrome. On the other hand, it will show us the axonal involvement of the lesions, and their extent by the summoning of the motor units. Some authors have concluded that detection EMG is not highly cost-effective for the positive diagnosis of CSC, but has an interest in differential diagnosis or screening for associated pathologies [11,13,18].

Conclusion

At the end of this study, we can conclude that CSC is a common condition that is secondary to a hyperpressure of the median nerve in the carpal tunnel. Clinical and electroneuromyographic correlation is often not obvious. CSC primarily affects young people in work and pre-female predominance. It is most manifested by finger pain and/or acroparesthesias of more troublesome intensity often nocturnal and concerns the territory of the median nerve. The demonstrations can be bilateral or one-sided and sensitivomotor, motor and sensitive. On electroneuromyographic examination, the axonal-type lesion is the most frequent nerve injury and electroneuromyographic examination is of paramount importance, it helps to guide management.

Conflict of Interest

No conflict of interest.

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