Ultrasound has Supplementary Diagnostic Value to Clinical and Neurophysiological studies in Carpal Tunnel Syndrome

ARTICLE *in* EGYPTIAN JOURNAL OF NEUROLOGY, PSYCHIATRY AND NEUROSURGERY · JULY 2011

1 AUTHOR:

Ashraf Talaat Youssef
Fayoum University
13 PUBLICATIONS **0** CITATIONS

Original Article

Ultrasound has Supplementary Diagnostic Value to Clinical and Neurophysiological studies in Carpal Tunnel Syndrome

Hala A. Shaheen[1], Asharaf T. Yossef [2]
Departments of Neurology[1], Radiology[2], Fayoum University; Egypt

ABSTRACT

Background: Attaining gold standard test for confirming diagnosis and grading carpal tunnel syndrome (CTS) remained a challenge. Ultrasonography (US) is advocated as simple noninvasive method for CTS diagnosis. **Objective**: This study is aimed to evaluate the diagnostic value of ultrasonography in CTS. **Methods:** Fifty CTS patients (mean age 38.94 ± 11.85 years, 46 females and 4 males) underwent full history taking, Boston Carpal tunnel syndrome questionnaire, clinical examination including provocative tests and NCS. Ultrasonography was carried out for all patients and for twenty five; age and sex matched; healthy individuals as a control group. **Results:** US sensitivity, specificity, positive and negative predictive values were 90.4, 70.6, 93.8 and 60% respectively. Sonographic criteria of CTS were found in all patients including those with normal NCS. Significant correlation exists between US findings and all the neurophysiological measures. But poor agreement were encountered between neurophysiological and US grading**. Conclusion:** Ultrasonographic examination of the median nerve seems to be a promising method in the diagnosis of carpal tunnel syndrome particularly in mild cases, but not in grading it. Ultrasound has a complementary role to NCS in the diagnosis of clinically symptomatic CTS cases with normal nerve conduction. Further studies with wider series are needed to confirm our preliminary results. **[Egypt J Neurol Psychiat Neurosurg. 2011; 48(3): 207-214]**

Key Words: Carpal tunnel syndrome, Nerve conduction study, Ultrasonography.

INTRODUCTION

Carpal tunnel syndrome (CTS) is one of the most common upper limb compression neuropathies, account for approximately 90% of all entrapment neuropathies[1]. Its incidence in general population is estimated as high as 14.4%[2]. The clinical diagnosis of carpal tunnel syndrome (CTS); including provocative tests; have low sensitivity and specificity[3]. The sensitivity of provocative tests varies greatly and is estimated as 50%, 68%, 64%; the specificity is estimated as 73%, 73%, and 83% for Tinel sign, Phalen test and carpal compression test respectively[4,5,6]. Other study reported lower sensitivity for carpal compression test between 28% and 63% and specificity is between 33% and 74%[7]. Square-shaped wrist and weakness of the abductor pollicis brevis were reported as the two most sensitive CTS signs (69 and 66% respectively)[4]. Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) is a carpal tunnel syndrome specific assessment questionnaire. It assesses not only the severity of symptoms but also the functional status in patients[8]. BCTQ is the most commonly used outcome measure in the assessment of patients with CTS. It is a validated tool with excellent reproducibility, internal consistency and reliability[9].

Correspondence to Hala A. Shaheen, Department of Neurology, Fayoum University, Egypt. Tel.: +20107965888. Email: Shaheen.hala@yahoo.com.

Though nerve conduction studies are the gold standard test for confirming diagnosis of CTS, localizing the level and determining the severity of median nerve compression, routine NCS may miss the diagnosis of CTS in up to 25% of cases, with sensitivities ranging between 49% and 84%. Moreover small percentage of asymptomatic individuals can have positive NCS, with specificities of 95% and 99%[10]. The development of high resolution ultrasound (US) transducers (7-15 MHz) allows evaluation of normal and abnormal US appearances of the median nerve, provides fast and noninvasive imaging of the carpal tunnel and its contents[11]. Median nerve compression is revealed on US by the classic triad of nerve flattening in the distal tunnel, nerve swelling and palmar bowing of the flexor retinaculum. Nerve cross-sectional area greater than 9.8 mm^2 at the level of the proximal tunnel is reported to be the best criterion for the diagnosis[12].

This study is aimed to evaluate the value of ultrasonography (US) in the diagnosis and grading of CTS severity.

PATIENTS AND METHODS

Patients:

This study was performed in Fayoum university hospital. It included fifty CTS patients; enrolled from neurology outpatients' clinic and referred from

rheumatology and orthopedic clinics after taking approval of ethical committee of our university. Twenty five healthy volunteers were also included as a control group. All patients and control group signed informed consent after the procedures were explained to them.

The patients' age ranged from 24 to 68 years with mean age of 38.94±11.85. They were 46 female and 4 males. The control group mean age was 38.04±11.06 years, ranged from 25-66 years. They were 23 females and 2 males. The control group was age and sex matched to the patient group (P: 0.695, 1) respectively. The mean patients' duration of symptoms were 17.12±20.56 months ranging from 1 month to 7 years with 7 months median duration.

Exclusion criteria: Patients have any other neurological disease as; cervical radiculopathy, peripheral neuropathy, history of trauma to the hand or wrist or have associated medical conditions; that may be a contributing factor to the patients' symptoms were excluded from the study.

Methods:

All patients underwent **full history taking and detailed neurological examinations with special inquiry about symptoms suggestive of CTS**. Paresthesias timing, manner and distribution, motor involvement as weakness, functional disabilities, provocative and alleviating factors and associated medical conditions were also inquired. Sensory examination for touch and pain were done.

Motor examination includes inspecting the hand for thenar muscle atrophy and testing the abductor pollicis brevis muscle strength. **Provocative tests include Tinel sign, Phalen test, reverse Phalen test, carpal compression test (median nerve compression test)** [4,5,6] were also done.

Square-shaped wrist, was measured at the distal wrist crease, a ratio of greater than 0.7 for the anterior-posterior dimension divided by the mediolateral dimension was considered positive[4].

Boston Carpal Tunnel Syndrome Questionnaire (BCTQ)[8] was filled for all patients. It comprises two scales, a symptom severity scale and a functional status scale. The symptom severity scale has 11 questions scored from 1 point (mildest) to 5 points (most severe). The functional status scale has eight questions scored from 1 point (no difficulty with activity) to 5 points (cannot perform the activity at all). The overall score for both scales was calculated as the mean of the items, a higher score indicating a greater disability.

Nerve conductive studies (NCS) were performed using Nicolet Viking, electromyography machine USA. The median, ulnar motor and sensory responses were recorded. Median versus ulnar sensory and palmar mixed nerves studies were added in cases with normal results. Needle electromyography (EMG) testing was needed to differentiate CTS from cervical radiculopathy and in severe cases of CTS to document denervation to the APB muscle[13,14]. The severity of CTS was assessed based on the results of NCS using a previously reported neurophysiologic classification[15].

Ultrasound was carried out by sonographers blinded to the clinical and NCS results using a general electric (logic 7) machine Germany, real time B mode study. The carpal tunnel was scanned with 12 MHz linear transducer in both axial and sagittal planes. The transverse image of the median nerve appeared on the screen as an oval or ellipsoid hypoechoic reticular area with a hyperechoic rim. Nerve cross-sectional area greater than 9.8 mm^2 at the level of the proximal tunnel is the used criterion for CTS diagnosis. US cut-off points that discriminate between different grades of CTS severity was as follow 9.9 -13.0 mm for mild, >13.0-15.0 mm, moderate and >15.0 mm, severe. The median nerve in the carpal tunnel was then scanned in the longitudinal plane to determine the longitudinal compression sign (LCS). A nerve with a smooth even contour was graded LCS 0, equivocal or minimal tapering or a notch, graded 1, definite tapering or a notch, graded 2, and marked narrowing or dipping with a distorted nerve contour, graded 3 LCS[12].

Statistical analysis

Statistical package for social science (SPSS) version 15 was used for data management and analysis. Quantitative data were expressed as mean ± SD. While qualitative data were expressed as number and percentage. Chi-square test was used for comparison between qualitative variables groups. Independent sample T test was used for normally distributed quantitative variables. Validity of the used tests was done by calculating their sensitivity, specificity and predictive values. Correlation coefficient was calculated for the association between NCS and ultrasound finding. The agreement between NCS and US was calculated with Cohen's kappa coefficient. P-values $\leq$ 0.05 was considered significant.

RESULTS

Clinical Results:

Symptoms and signs:

Almost all patients' symptoms and signs have low sensitivity, specificity and predictive values in detecting CTS (Table 1).

Provocative test:

Almost all provocative tests used in this study have good sensitivity and positive predictive value but low specificity and negative predictive value in

detecting CTS (Figure 1).

Boston Carpal Tunnel Syndrome Questionnaire (BCTQ):

BCTQ symptom severity scale mean was 3.23±0.61 ranging from 2.09 to 4.27. The functional status scale mean was 2.46 ranging from 1.5 to 4.The Total score mean was 2.85±0.46 ranging from 2.09 to 3.48. (BCTQ) was found to be 81.9% sensitive but only 29.4% specific. BCTQ had 85% positive predictive value but only 25% negative predictive value. The functional status scale significantly positively correlates with distal latency and negatively with the conduction velocity of median nerve (r 0.248, -0.360 & P 0.013, 0.000 respectively). The Total score significantly negatively correlates with the conduction velocity of median nerve (r -0.364 & P 0.000 respectively).

Nerve Conduction Study Results:

Thirty six patients (72%) had bilateral CTS, whereas 9 patients (18%) had unilateral CTS. Normal conduction study was encountered in 5 patients clinically suspected to have CTS.

Ultrasound Results:

All ultrasonic measurements differed significantly between the patients and the control groups, Cross-sectional area was 15.2±5.22 in the patients versus 7.36±1.5 the control, P (.000). Also cross-sectional area grading and compression grading comparison was significant P (.000). Figure (2) shows within normal ultrasound criteria of the median nerve; transverse (2A) and longitudinal section (2 B). Figures (3) show ultrasound criteria of patient with moderate carpal tunnel syndrome.

Ultrasound Parameters Validity:

In comparison to nerve conduction studies, ultrasound CSA was found to be 90.4% sensitive, 70.6% specific, has 93.6% positive predictive value and 60% negative predictive value in detecting CTS. Ultrasound compression grading was found to be 67.5% sensitive, 82.4% specific, has 94.9% positive predictive value and 34.1% negative predictive value in detecting CTS (Figure 4).

Ultrasound measurement grading versus nerve conduction grading:

Low agreements were found between nerve conduction studies grading and ultrasound CSA grading (0.053), ultrasound compression grading (0.060).

Ultrasound cross sectional area confirmed the diagnosis of CTS in the 5 cases with symptoms suggestive of CTS and normal neurophysiological findings. But cross sectional area grade them as severe. By compression grading, three of them were identified, two was graded as mild and one as moderate.

Correlation Studies:

The severity score of BCTQ symptom significantly negatively correlates with the cross sectional area, cross sectional area grading and compression grading of median nerve assessed by ultrasound (r-0.314 & P 0.027, r-0.353 & P 0.012 r-0.361 & P 0.010 respectively). Statistically significant correlations were found between ultrasound and neurophysiologic parameters. Cross sectional area (CSA) of the median nerve, CSA grading and compression grading significantly positively correlate with sensory, motor distal latency and NCS grading but negatively correlate with the conduction velocity and amplitude of median nerve (Table 2 and Figures 5, 6).

Table 1. Frequency and validity of patients' symptoms and signs.

Symptoms and signs	Frequency Number (%)	Sensitivity	Specificity	Positive predictive value	Negative predictive value
Intermittent paresthesias	32 (64%)	56.6	43.4	73.4	100
Continuous paresthesias	18 (36%)	43.4	56.6	100	73.4
Hyper analgesia	42 (84%)	83.1	16.9	82.1	87.5
Hypo analgesia	8 (16%)	16.9	83.1	87.5	82.1
Difficulty manipulating small objects	12 (24%)	79.5	41.2	86.8	29.2
Provocative factors as holding something	27 (54%)	37.3	11.8	67.4	3.7
Shaking the hand to lessen the symptoms	29 (58%)	48.2	88.2	95.2	25.9
Sensory signs	48 (96%)	95.2	0	82.3	0
Weakness of thumb abduction	13 (26%)	31.3	100	100	23
Thenar muscle atrophy	6 (12%)	14.5	100	100	19.3
Square-shaped wrist	11 (22%)	25.3	94.1	95.5	20.5

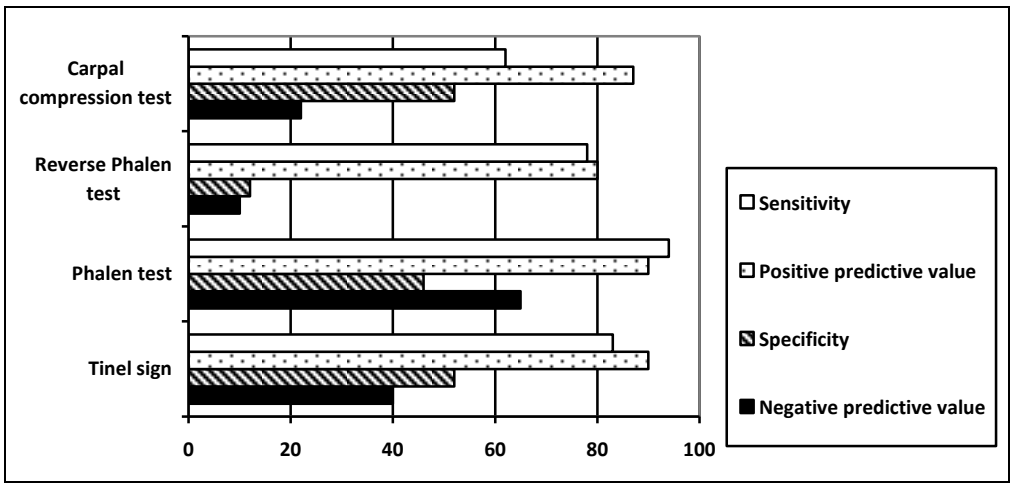


Figure 1. Sensitivity, specificity and predictive values of the provocative test.

Figure 2A. Transverse section of carpal tunnel showing within normal Cross sectional area of the median nerve.

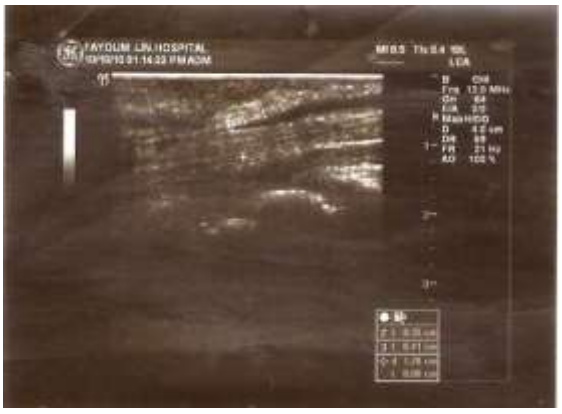
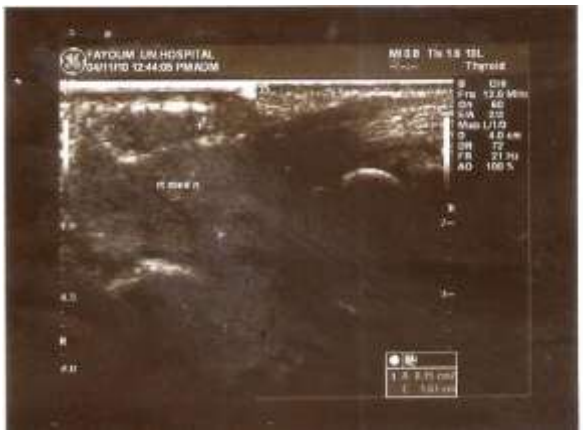


Figure 2B. Longitudinal section of carpal tunnel showing grade 0 (No) compression on the median nerve.



Figures 3. Transverse section of carpal tunnel (on the right) showing moderate increase of median nerve cross sectional area and longitudinal section (on the left) showing grade 2 compression.

Table 2. Correlations between ultrasound and neurophysiological parameters.

Correlations between ultrasound and neurophysiologic parameters	Ultrasound parameters					
	Cross sectional area		Cross sectional area grading		Compression grading	
Neurophysiological parameters	**R**	**T**	**R**	**T**	**R**	**T**
Distal latency motor	0.369	0.000	0.500	0.000	0.351	0.000
Conduction velocity	-0.204	0.042	-0.296	0.003	-0.093	0.356
Amplitude	-0.267	0.007	-0.308	0.002	-0.265	0.041
Distal latency sensory	0.290	0.010	0.519	0.000	0.424	0.000
Neurophysiological grading	0.441	0.000	0.370	0.000	0.251	0.012

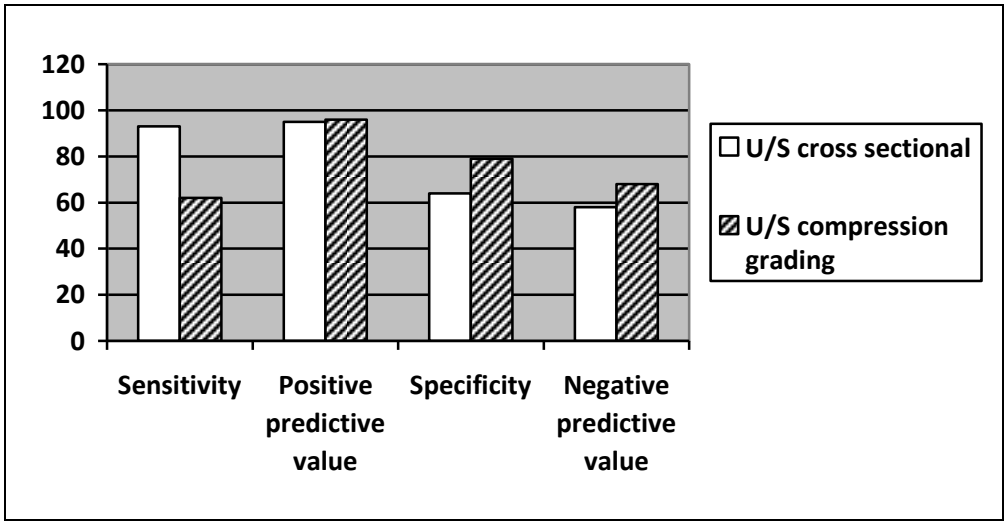


Figure 4. Validity of ultrasound measures in detecting CTS.

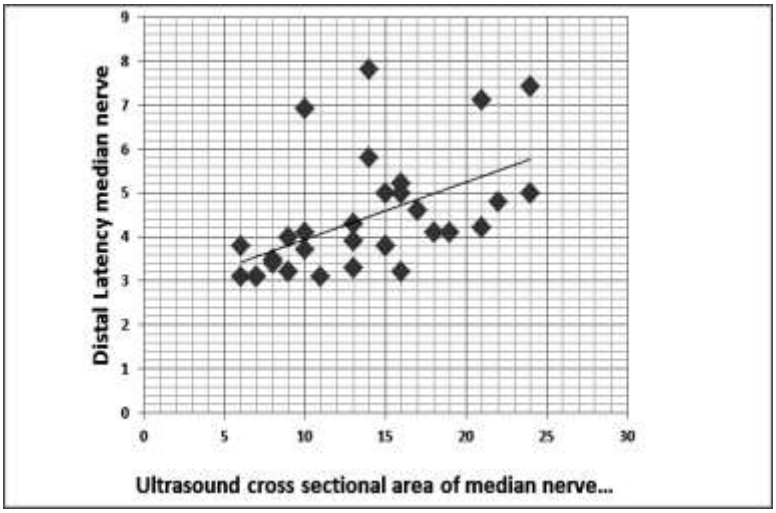


Figure 5. Correlations between ultrasound cross sectional area and Distal latency of the of median nerve

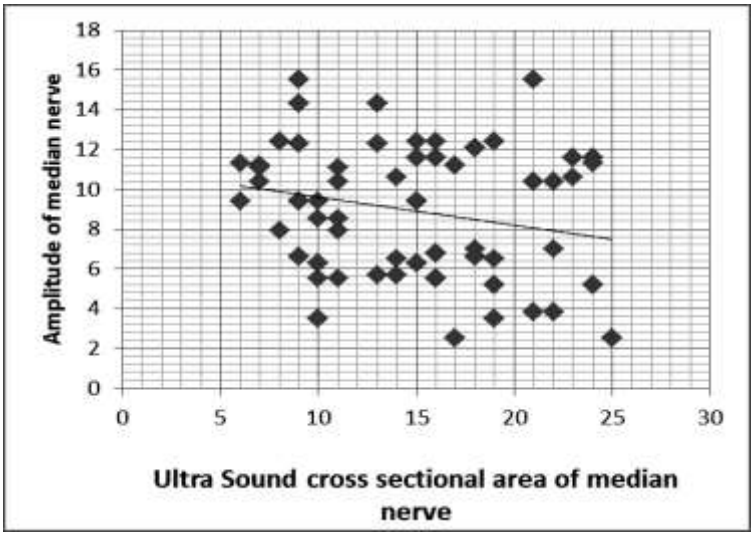


Figure 6. Correlations between ultrasound cross sectional area and amplitude of median nerve.

DISCUSSION

None of the tests described in the clinical diagnosis of carpal tunnel syndrome (CTS) are diagnostic on their own. They all have low validity. In this study in accordance to others [4, 5,6,8,9] the clinical history and examination had low sensitivity and specificity. Provocative tests and Boston Carpal Tunnel Syndrome Questionnaire though have rather good sensitivities yet their specificities are low.

Nerve conduction studies have certain limitations and routine NCS may miss the diagnosis of CTS in up to 25% of cases, with sensitivities ranging between 49% and 84%. Internal comparison study reduce false-negative rate to 10-15% [13]. Similarly in this study five cases (10%) had normal NCS.

The development of high-resolution ultrasound (US) transducers (7-15 MHz) has allowed evaluation of normal and abnormal US appearances of the median nerve. On transverse scans, the normal median nerve is elliptical and flattens progressively as it courses distally. Median nerve compression is revealed on US by the classic triad of nerve swelling (edema) with increase of CSA, nerve flattening in the distal tunnel; longitudinal compression sign (LCS); and palmar bowing of the flexor retinaculum (FR). Studies have been introduced to better quantify these abnormal findings; a nerve cross-sectional area greater than 9.8 mm2 at the level of the proximal tunnel and degree of longitudinal nerve compression are reported to be the best criterion for the diagnosis[12]. The flattening of the FR is found to be highly variable, poorly predictive and have no correlation with diagnosis of CTS[16]. Reduced transverse sliding of the nerve beneath the retinaculum during flexion and extension of the index finger also may be seen, but this sign is harder to quantify and may be too subjective[17]. Accordingly in this study cross-sectional area and compression grading were chosen to quantify CTS.

In agreement with the previous studies[18,19,20] cross-sectional area of the median nerve was found to be significantly higher in the CTS patients (15.2±5.22) when compared with controls, (7.36±1.5), (P value 0.000). This increase in cross-sectional area could be attributed to the nerve edema. CTS caused by median nerve compression in the carpal tunnel. This nerve compression induces marked changes in intraneural microcirculation and nerve fiber structure, impairment of axonal transport, and alterations in vascular permeability, with edema formation and deterioration of nerve function.

High-resolution US is advocated as having several advantages being relatively fast, noninvasive and inexpensive but there is still a controversy about its diagnostic efficiency and grading accuracy[21]. This study is aimed to evaluate the diagnostic value of ultrasonography in CTS.

We found CSA had higher sensitivity (90.4%) and specificity (70.6%) than clinical tests in detecting CTS. Ultrasound compression grading was found to be 67.5% sensitive, 82.4% specific in detecting CTS. The US measurements validity reported in the literatures varied between 70% to 94% sensitivities and 63% to 97% specificities[11,12,18,21]. Variable ultrasound criteria employed in diagnosis and the different cutoff point of CSA used to diagnose CTS contributes to this variability.

Low agreements were found in this study between nerve conduction studies grading and ultrasound CSA grading (0.053), ultrasound compression grading (0.060). Similarly, Moran et al.[22]

had reported 0.619 agreements between the US and NCS. It is still not known whether intermittent mechanical compression or rise in intracanal pressure could vary from time to time accounting for this disagreement or ultrasound grading need to be revised. Thus Sonographic measurement of median nerve CSA could be good initial diagnostic test for CTS but cannot grade the severity of CTS as NCS.

In the present study in agreement with El-Miedany et al.[18], significant correlations had been demonstrated between ultrasound and NCS parameters. Cross sectional area, CSA grading and compression grading positively correlate with sensory, motor distal latency and NCS grading but negatively correlate with conduction velocity and amplitude of median nerve. Thus the median nerve affection detected by the NCS could be a reflection of nerve swelling detected by calculation of the CSA and compression grading.

In this study ultrasound cross sectional area confirmed the diagnosis of CTS in the 5 patients with symptoms suggestive of CTS and normal neurophysiological findings; grade them as severe. By compression grading, three of these 5 patients were identified; two graded as mild and one as moderate. Koyuncuoglu et al.[23] found larger CSA in patients with clinical diagnosis of CTS and negative NCS findings when compared with the control group. It is still not known exactly whether median neuropathy develops as a result of intermittent mechanical compression or as a result of vascular compromise due to a rise in intracranial pressure. Perhaps both are responsible for the progression of CTS[24]. It may take time till nerve compression affects conduction studies thus early in the course of the disease, NCS appear normal. Median nerve edema detected by ultrasound, revealed in the early stage of CTS without any electrophysiological changes, might be an important factor in occurrence of patients' complaints.

Limitations of the study: Small number of patient group with normal NCS, we cannot reach conclusions about them. Before we recommend wide use of ultrasound in CTS diagnosis, we should take into considerations although musculoskeletal ultrasound is widely used in Europe, familiarity with and training on the performance and interpretation of carpal tunnel ultrasonography is recently starting in Egypt.

Conclusions and Recommendations

Ultrasonographic examination of the median nerve CSA is a good initial diagnostic test for carpal tunnel syndrome. It had higher sensitivity and specificity than the clinical tests. But it cannot grade the severity of CTS as NCS. In cases of clinically symptomatic CTS with normal conduction findings, ultrasound may have a complementary role to nerve conduction studies. Further studies with wider series are needed to confirm our preliminary results.

[Disclosure: Authors report no conflict of interest

REFERENCES

1. Aroori S, Spence R. Carpal tunnel syndrome. Ulster Med J. 2008 January; 77(1): 6–17.
2. Ferry S, Pritchard T, Keenan J, Croft CM, Silman CM. Estimating the prevalence of delayed median nerve conduction in the general population. Br J Rheumatol. 1998; 37(6): 630–5.
3. Katz JN, Simmons BP, Robert B. Clinical practice. Carpal tunnel syndrome. N Engl J Med. 2002; 346(23): 1807–12.
4. Kuhlman KA, Hennessey WJ. Sensitivity and specificity of carpal tunnel syndrome signs. Am J Phys Med Rehabil. 1997; 76(6):451–711.
5. Stevens JC, Sun S, Beard CM, O'Fallon WM, Kurland CM. Carpal tunnel syndrome in Rochester, Minnesota,. Neurology. 1988; 38(1):134–8.
6. Bruske J, Bednarski M, Grzelec H, Zyluk A. The usefulness of the Phalen test and the Hoffmann-Tinel sign in the diagnosis of carpal tunnel syndrome. Acta Orthop Belg. 2002; 68(2):141–5.
7. Mondelli M, Passero S, Giannini F. Provocative tests in different stages of carpal tunnel syndrome. Clin Neurol Neurosurg. 2001; 103(3): 178–83.
8. Levine DW, Simmons BP, Koris MJ, Daltroy LH, Hohl GG, Fossel AH, et al. A self-administered questionnaire for the assessment of severity of symptoms and functional status in carpal tunnel syndrome. J Bone Joint Surg Am. 1993; 75(11): 1585-92
9. Giannini F, Cioni R, Mondelli M, Padua R, Gregori B, D'Amico P, et al. A new clinical scale of carpal tunnel syndrome: validation of the measurement and clinical-neurophysiological assessment. Clin Neurophysiol. 2002; 113(1):71–7.
10. D Browning PD. Carpal Tunnel Syndrome [Internet]. New York: Medscape LLC; 2009 Apr 1 [Updated 2011 May 5; Cited 2009 Sep 1]. Available from: http://emedicine.medscape.com/article/388525-overview/.
11. Wong SM, Griffith JF, Hui AC, Lo SK, Fu M, Wong KS. Carpal tunnel syndrome: diagnostic usefulness of sonography. Radiology. 2004; 232: 93-9.
12. Wang LY, Leong CP, Huang YC, Hung JW, Cheung SM, Pong YP. Best Diagnostic Criterion in High-resolution Ultrasonography for Carpal Tunnel Syndrome Chang Gung Med J. 2008; 31:469-76.
13. Jablecki CK, Andary MT, Floeter MK, Miller RG, Quartly CA, Vennix MJ. Practice parameter: Electrodiagnostic studies in carpal tunnel syndrome. Report of the American Association of

Electrodiagnostic Medicine, American Academy of Neurology, and the American Academy of Physical Medicine and Rehabilitation. Neurology. 2002; 58(11):1589-92.

14. Sandbrink F. Median Neuropathy [Internet]. New York: Medscape LLC [Updated 2010 Apr 27 cited 2010 Aug 16]. Available from: http://emedicine.medscape.com/article/1141168.
15. Padua L, LoMonaco M, Gregori B, Valente EM, Padua R, Tonali P Neurophysiological classification and sensitivity in 500 carpal tunnel syndrome hands. Acta Neurol Scand. 1997 96: 211-7.
16. Klauser AS, Halpern EJ, De Zordo T, Feuchtner GM, Arora R,Wong SM, et al. Carpal tunnel syndrome: diagnostic usefulness of sonography. Radiology. 2004; 232: 93-9.
17. Klauser AS, Halpern EJ, De Zordo T, Feuchtner GM, Arora R, Gruber O, et al .Carpal tunnel syndrome assessment with US: value of additional cross-sectional area measurements of the median nerve in patients versus healthy volunteers. Radiology. 2009; 250:171-7.
18. El Miedany YM, Aty SA, Ashour S. Ultrasonography versus nerve conduction study in patients with carpal tunnel syndrome: substantive or complementary tests? Rheumatology. 2004; 43:887-95.
19. Domanasiewicz A, Koszewicz M, Jabłecki J. Comparison of the diagnostic value of ultrasonography and neurography in carpal tunnel syndrome. Neurol Neurochir Pol. 2009 Sep-Oct; 43(5):433-8.
20. Akcar N, Ozkan S, Mehmetoglu O, Calisir C, Adapinar B.Value of Power Doppler and Gray-Scale US in the Diagnosis of Carpal Tunnel Syndrome: Contribution of Cross-Sectional Area just before the Tunnel Inlet as Compared with the Cross-Sectional Area at the Tunnel. Korean J Radiol. 2010 Nov-Dec; 11(6):632-9.
21. Karadağ YS, Karadağ O, Çiçekli E, Oztürk S, Kiraz S, Ozbakir S, et al. Severity of Carpal tunnel syndrome assessed with high frequency ultrasonography. CTS. Rheumatol Int. 2010 Apr; 30(6):761-5.
22. Moran L, Perez M, Esteban A, Bellon J, Arranz B, del Cerro M. Sonographic measurement of cross-sectional area of the median nerve in the diagnosis of carpal tunnel syndrome: correlation with nerve conduction studies. J Clin Ultrasound. 2009 Mar-Apr; 37(3):125-31.
23. Koyuncuoglu HR, Kutluhan S, Yesildag A, Oyar O, Guler K, Ozden A. The value of ultrasonographic measurement in carpal tunnel syndrome in patients with negative electrodiagnostic tests. Eur J Radiol. 2005; 56:365-9.
24. Padua L, Pazzaglia C, Caliandro P, Granata G, Foschini M, Briani C. Carpal tunnel syndrome: ultrasound, neurophysiology, clinical and patient-oriented assessment. Clin Neurophysiol. 2008 Sep; 119(9):2064-9.

الملخص العربى

مرض متلازمة النفق الرسغي دراسة إكلينيكية
وبتوصيل الأعصاب وبالموجات فوق الصوتية

لا يوجد اختبار اكلينيكى يمكنه منفردا تشخيص مرض متلازمة النفق الرسغى. علاوة على ذلك، هناك نسبة كبيرة من المرضى تظهر فيهم نتائج التوصيل العصبي طبيعية. حديثا بدأت الموجات فوق الصوتية تظهر كطريقة بسيطة وسريعة لتشخيص هذا المرض. تهدف هذه الدراسة لتقييم القيمة التشخيصية للموجات فوق الصوتية فى مرض متلازمة النفق الرسغى. **المرضى والأساليب:** خمسون من مرضى متلازمة النفق الرسغى (متوسط أعمارهم ٣٨.٩٤ ± ١١.٨٥ سنة، ٤٦ من الإناث و ٤ من الذكور) خضعوا لأخذ التاريخ المرضى كاملا واستبيان بوستن، والاختبارات الإكلينيكية ودراسة توصيل الأعصاب. وتم عمل الموجات فوق الصوتية لجميع المرضى و ٢٥ من الأفراد الأصحاء متطابقين فى العمر والجنس مع المرضى كمجموعة ضابطة. **النتائج:** أظهرت هذه الدراسة أن الحساسية والدقة، والقيم التنبؤية الإيجابية والسلبية للموجات فوق الصوتية هى ٩٠.٤ ، ٧٠.٦ ، ٩٣.٨ و ٦٠٪ على التوالي. وقد وجدت مواصفات مرض متلازمة النفق الرسغى بالموجات فوق الصوتية في جميع المرضى متضمنة هؤلاء المرضى التى ظهرت نتيجة التوصيل العصبى فيهم طبيعية. كما وجد ارتباط ذو دلالة احصائية بين نتائج الموجات فوق الصوتية والفحص الكهروفسيولوجى ولكن لم يتفق الفحصين فى تحديد درجة المرض. **الاستنتاجات والتوصيات:** الفحص بالموجات فوق الصوتية للعصب الوسطى يبدو طريقة واعدة في تشخيص متلازمة النفق الرسغي لاسيما في الحالات الخفيفة، ويمكن أن يلعب دورا هاما في تشخيص الحالات التى كان التوصيل العصبي فيها طبيعيا. وهناك حاجة إلى مزيد من الدراسات الأوسع نطاقا لتأكيد النتائج الأولية لدينا.