Author’s response to reviews

Title: Ratio and difference of the cross-sectional area of median nerve to ulnar nerve in diagnosing carpal tunnel syndrome: a case control study 1Yi-Wei Chang, MD, 2Tsung-Cheng Hsieh, PhD, 3I-Shiang Tzeng, PhD, 1Valeria Chiu, MD, 1 Pei-Jung Huang, MD, 1, 4Yi-Shiung Horng, MD PhD

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Author’s response to reviews:

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Title: Ratio and difference of the cross-sectional area of median nerve to ulnar nerve in diagnosing carpal tunnel syndrome: a case control study

Authors: 1Yi-Wei Chang, MD, 2Tsung-Cheng Hsieh, PhD, 3I-Shiang Tzeng, PhD, 1Valeria Chiu, MD, 1 Pei-Jung Huang, MD, 1, 4Yi-Shiung Horng, MD PhD

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Author's response: see over

Reviewer reports:

Maria Pilar Aparisi Gomez (Reviewer 1): Thank you very much for your submission.
Your study seeks to establish what is the level of accuracy for the measurement of median-to-ulnar nerve ratio (MUR) and median-to-ulnar nerve difference (MUD), measured by ultrasound, in patients with carpal tunnel syndrome. With this purpose, you compare 32 affected patients with 32 asymptomatic patients, and find good results by introducing the use of MUD added to MUR.

Thank you very much for the opportunity to review this scientific paper.

This is a well-structured and well-presented study.

The limitations have been satisfactorily detected. These limitations do not affect the validity of the results to be used in a reasonably ample sector of the population. It is noted though, that the parameters of MUR and MUD will be more sensitive in patients in which the pathology is more severe and therefore there is the possibility that diagnosis will have been possible by other techniques.

Overall, the use of language and expressions is satisfactory.

These are some specific (minor) comments:

In your introduction, (page 6, line 9) you propose the use of the ratio and difference of the CSA of the median nerve to that of the ulnar nerve at the pisiform level as ultrasonographic diagnostic criteria for CTS, through the evaluation of MUR and MUD.

This is correctly expanded in the discussion, but it would be recommended to briefly introduce the reasons behind the selection of these parameters for the study, and give a little bit of background on the use of this particular approach (comparison with ulnar nerve) to the diagnosis of carpal tunnel syndrome.

Response: Thank you for reviewer’s kindly suggestion. We have added more description in the introduction section

(page 6 ,line 8 )

On the contrary, the ulnar nerve at the wrist level has been shown to have no significant difference in CSA between patients with CTS and healthy controls [19]; accordingly, the ulnar nerve is suitable to serve as an alternative internal control to compare with the median nerve. Previous studies tried to use median-to-ulnar-nerve ratio (MUR) to compare the CSAs of median to ulnar nerves at wrist level; however, their results did not provide superior diagnostic value
comparing to the CSA method [20, 21]. Therefore, in this study, we propose using the difference between the CSAs of the median and ulnar nerves at the pisiform level as a new diagnostic criterion, i.e., median-to-ulnar-nerve difference (MUD). The aim of this study is to compare the diagnostic accuracy of the MUR and the MUD in patients with CTS.

As a suggestion, to avoid confusion with the format of the references in some cases, it would be recommended to either not use numbers between brackets when listing items - the criteria for exclusion, for example - or as an alternative perhaps use alphabet characters or roman numerals. Numbering the items is perhaps not always necessary (when there are two items, for example).

Response: Thank you for your suggestion. We have replaced the number with the alphabet character and removed some numbering to avoid confusion with reference numbers.

(page 7, line 17)

(A) age < 20 years; (B) electrodiagnostic evidence of ulnar neuropathy at the wrist level; (C) previous trauma or surgical history of the hand; (D) medical history of hypothyroidism, diabetes mellitus, uremia, rheumatoid arthritis, amyloidosis, and acromegaly; and (E) pregnancy.

(page 10, line 12)

The diagnosis of CTS was established if one of the two following criteria was met in the median nerve NCS: distal motor latency >4.4 ms and distal sensory latency >3.4 ms [25]. The participants were screened and excluded for subclinical ulnar neuropathy at the wrist level on the basis of the following criteria: ulnar nerve NCS distal motor latency >3.6 ms and ulnar nerve NCS distal sensory latency >3.4 ms [26, 27].

(page 15, line 9)

A) a flattening of the median nerve at the hamate level; B) an increase in the CSA of the median nerve at the pisiform level; C) an increase in the ratio of median nerve CSA at the pisiform level to median nerve CSA at the distal radius level; and D) palmar bowing of the transverse carpal ligament [31]
Federico Ponti (Reviewer 2): It's a very good work, carried out very diligently.

The methodology used is proper, and the idea good.

I believe that the paper could be very useful in clinical practice to waiting for scientific results of wider impact, specially in patients who exhibit mild symptoms.

I only suggest to specific about the ultrasound landmark of median nerve CSA at DRUJ level (page 11, line 8 and 9).

Under my point of view no more changes should be made.

Response: Thank you for your kindly suggestion. Further description of the DRUJ landmark has been added for better clarification.

(page 11 ,line 18)

The DRUJ level could be identified between the distal radius and ulna, while tracing proximally from the pisiform level.