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Carpal tunnel syndrome associated with arteriovenous fistula function in long term hemodialysis patients

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Background: Carpal tunnel syndrome (CTS) is associated with various systemic diseases such as rheumatoid arthritis, hypothyroidism, peripheral neuropathy and diabetes mellitus (DM).In hemodialysis patients, several factors can contribute to CTS, including amyloid deposition, generalized fluid retention, increased synovial volume, edema around the nerve, and an ischemic or 'steal' effect distal to a dialysis access.This study aimed to evaluate the influence of arterio-venous fistula (AVF) dysfunction on the development of CTS.

Methods: The study included 43 patients (23 male &20 female) on maintenance hemodialysis via AVF and 97 healthy controls. The median nerves of study population were examined by ultrasonography. Cross-sectional area (CSA) of the median nerve was measured at the distal wrist (CSA-D), and proximal forearm (CSA-P), and wrist-to-forearm ratio (WFR; CSA-P/CSA-D) was calculated for each hand.We also investigated the history of percutaneous transluminal angioplasty (PTA) in them.

Results: The mean age of hemodialysis patientswas 60.4 ± 16.0 years. The mean duration on hemodialysis was 48.3 ± 39.6 months. The WFRs in hemodialysis patients were higher than those in healthy controls (1.37 ± 0.45 vs. 1.21 ± 0.25, $P < 0.05$). The hands with AVF (n = 43) showed higher WFR than those without AVF (n = 43)in hemodialysis patients (1.35 ± 0.47 vs. 1.25 ± 0.26, $P < 0.05$). The WFRs in patients with a history of PTA were higher than those in patients without a history of PTA (1.46 ± 0.56 vs. 1.23 ± 0.32, $P < 0.05$).

Conclusion: In maintenance hemodialysis patients, WFR of median nerve was significantly increased in the hand with AVF. Moreover, development of CTS was related not only to AVF itself, but also to AVF function.

Keywords: arteriovenous fistula , carpal tunnel syndrome, hemodialysis