

Summary results overview

Baseline characteristics:

Study was performed on 60 median nerves of 60 patients. They were diagnosed as idiopathic carpal tunnel syndrome (CTS) and classified randomly into 3 groups (each contains 20 patients) according to the treatment program received: group I (ultrasound guided corticosteroids injection), group II (ultrasound guided perineural Dextrose 5% injection) and group III (ultrasound guided platelet rich plasma injection). Patients included in the study were male and female, adult age, diagnosed with mild and moderate idiopathic CTS according to the electrophysiological studies with clinical symptoms for at least 3 months.

Participant flow

Sixty participants were admitted and examined for eligibility and were found to be qualified to participate in the trial. They were randomly divided into 3 groups (20 each), ultrasound guided corticosteroids injection (group 1), ultrasound guided perineural Dextrose 5% injection (group 2) and ultrasound guided platelet rich plasma injection (group 3). Patients were evaluated before and 3 months after injections.

Adverse events

No adverse events occurred throughout the study.

Outcome measures description

All patients will be subjected to the following: Full medical history taking and clinical examination including sensory and motor examination. Provocative tests: Tinel test, Phalen test and Reverse Phalen test. Nerve Conduction studies (NCS) to confirm the diagnosis of CTS and to assess the degree of severity. Diagnostic neuromuscular ultrasound to evaluate Cross section area (CSA) of the median nerve. And to assess median nerve mobility in CTS during passive flexion and extension of the wrist and digits.

Pain and function assessment using Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) to evaluate the severity of symptoms and functional status

for patients with CTS. The patients will be asked to stop analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) for 48 hours before injection.

Study Interventions:

The patients will be randomly divided into three groups:

Group 1:

Twenty patients will be injected with ultrasound guided local corticosteroids as follows: 1 ml of Methyl prednisolone Acetate (as 40 mg of Depo-Medrone 40mg/ml) with the following technique: At the volar side of the wrist proximal to the wrist crease medial to the Palmaris longus tendon and the injection was given using 25 Gauge needle with angle of introduction 30- 40.

Group 2:

Twenty patients will be injected by ultrasound-guided with 5 ml of D5W using an in-plane ulnar approach at the proximal carpal tunnel inlet (ie, the scaphoid-pisiform level). A 3-ml injectate will be used to remove the nerve from the flexor retinaculum via hydrodissection, and a residual 2-ml injectate will be delivered to the inferior part of the median nerve for separation from the underlying subsynovial connective tissue and flexor tendon. After injection, the whole carpal tunnel will be scanned to ensure that the injectate distributed throughout the proximal-to-distal carpal tunnel.

Group 3:

Twenty patients will be injected by ultrasound guided with PRP that can be prepared as follows: Fifteen ml of whole blood will be taken from the patient, and it will added quickly to ACD (anticoagulant citrate dextrose solution) in the centrifuge tube with a ratio 10:1 and will be centrifuged for double spin (1500 rpm for 15 mins to separate the erythrocytes, then 3500 rpm for 10 mins).

One ml of PRP will be collected by a 22 gauge syringe 3 cm. Good sterilization of the targeted area for injection. Then the syringe will be injected by ultrasound-guided into the CT with the same technique of corticosteroid injection.

After injection the patient will be asked to apply ice on the site of injection as they may complain of discomfort in the first 48 hours. Using NSAID is prohibited, only acetaminophen can be used in pain control. Rest is recommended, they have to limit their activities for 24 hours after injection.

Reassessment of the patients will be done after 3 months by: clinical assessment, provocative tests, Boston Carpal Tunnel Syndrome Questionnaire (BCTQ), nerve conduction studies and diagnostic neuromuscular ultrasound.

Statistical analysis:

The collected data will be coded, tabulated, and statistically analyzed using IBM SPSS statistics (Statistical Package for Social Sciences) software version 28.0, IBM Corp., Chicago, USA, 2021. Quantitative data tested for normality using Shapiro-Wilk test, then if normally distributed described as mean \pm SD (standard deviation) as well as minimum and maximum of the range, then compared using ANOVA test (three independent groups) and paired t-test (paired variables). Qualitative data described as number and percentage and compared using Chi square test and Fisher's Exact test for variables with small expected numbers as well as McNemar test (two dependent binary variables) and marginal homogeneity test (two dependent multinomial variables). Pearson correlation coefficients will be used to assess the correlation between two quantitative parameters in the same group. The level of significance was taken at P value < 0.050 was significant, otherwise was non-significant.