Comparative study on the effectiveness of a corticosteroid injection for carpal tunnel syndrome in patients with and without Raynaud’s phenomenon

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Introduction

- **Corticosteroid (CS) Injection for carpal tunnel syndrome (CTS)**
  - The optimal treatment for patients with mild/moderate CTS remains controversial
  - A local CS injection is an easy and cost-effective treatment, but long-term success rate following an injection varies from 0 to 63%
  - These variances may be due to differences in diagnostic criteria, the severity of CTS and the associated medical comorbidities of the patients

- **Primary Raunaud's phenomenon (RP)**
  - A common disorder characterized by reversible vasospasm of the extremities
  - Prevalence of RP in Caucasians ranges between 3% and 5%

- **Diagnosis of RP**
  - Cold intolerance severity score (CISS) of > 30
  - A positive cold provocation test with photoplethysmography
  - 10°C for five minutes

- **Corticosteroid injection**
  - Single 2mL injection
  - 1mL of 1% lidocaine and 1mL of triamcinolone acetonide
  - 23-gauge needle inserted 1cm proximal into the wrist crease

- **Functional assessment**
  - Functional assessment at 6, 12, and 24 weeks after the CS injection
    - The perception of touch with the Semmes-Weinstein monofilaments
    - The grip strength
    - Boston carpal tunnel syndrome questionnaire (BTCQ) and CISS (only 24 weeks) scores

- **Purpose of study**
  - To compare the outcomes of a corticosteroid injection for CTS in patients with or without Raynaud’s phenomenon

Materials & Methods

- **Subjects**
  - Retrospective Case-control study
  - 158 Patients with CTS were treated with corticosteroid injection
  - Inclusion criteria
    - Confirmation by nerve conduction studies
    - Persistent symptom that did not improve following 2 months of conservative treatment
  - Exclusion criteria
    - Previous injections or surgery to the involved wrist
    - Polyneuropathy, cervical radiculopathy, focal nerve entrapment other than CTS

- **Diagnosis of RP**
  - Cold provocation test with photoplethysmography
  - 10°C for five minutes

- **Exclusion criteria**
  - Previous injections or surgery to the involved wrist

- **Comparison of CS treatment and failure of treatment**
  - Functional assessment at 6, 12, and 24 weeks after carpal tunnel decompression
  - The perception of touch with the Semmes-Weinstein monofilaments
  - The grip strength
  - Boston carpal tunnel syndrome questionnaire (BTCQ) and CISS (only 24 weeks) scores

- **Failure of treatment**
  - The requirement for carpal tunnel decompression within six months of the injection

Results

- **Comparison of BCTQ symptom and function scores**
  - The 2 groups had similar baseline BCTQ scores, but the scores in the RP group were higher than those in the control group at 12 and 24 weeks after the injection

- **Comparison of grip strength and sensory index**
  - Throughout the 24-week, there were no difference in the grip strength between the groups, whereas the mean sensory index for the control was higher than that of the RP group

- **Comparison of CISS and treatment failure**
  - The CISS were not significantly different between the groups at baseline and after 24-week
  - After 24 weeks, 11 patients (32%) in the RP group and 16 patients (15%) in the control group required carpal tunnel decompression (p = 0.028)

- **Multivariable analysis**
  - Multivariable analysis indicate that concurrent Raynaud’s phenomenon (odds ratio (OR 2.6) and severe electrophysiological grade (odds ratio (OR 2.1) were independently associated with a failure of treatment after a CS injection

Discussion & Conclusions

- **Discussion**
  - Although the exact way in which RP affects CTS remains unclear,
    - Local or systemic irritation of the autonomic nervous system is thought to play a part
    - Vasomotor sympathetic fibres to the fingers are mainly conducted through the median nerve, and irritation of these fibres may cause the spasm seen in RP
    - Patients with cold intolerance reportedly have significantly less improvement after carpal tunnel decompression than patients without cold intolerance

- **Conclusion**
  - Although considerable improvements in symptoms will occur after CS injection for CTS in patients with Raynaud’s phenomenon, they have higher risk of poor functional outcomes and failure of treatment than those without Raynaud’s phenomenon