Correction of Vitamin D Deficiency is Associated with Better Surgical Outcomes in Women with Carpal Tunnel Syndrome

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Introduction

Carpal tunnel syndrome (CTS)
- Most common compressive neuropathy in the upper extremities
- Idiopathic CTS is the most common, but some risk factors like thyroid disease, DM, and obesity

Gül Yurdakul et al. 2015

Vitamin D(VD)
- Role in neuroprotection and neurotrophism
- Low VD is related to neuropathy in patients with DM, Sjögren’s syndrome, and neurodegenerative disorders


Relation of CTS and VD
- VD binding proteins in serum are down-regulated in patients with CTS

Oh et al. 2013

Purpose
- Evaluate whether correction of VD deficiency is helpful for better surgical outcomes in CTS

Study population
- Retrospective study
- 131 patient underwent Carpal Tunnel Release btw 2014 to 2016
- Exclude
  - VD non-deficient (n=40)
  - Osteoporosis med. with VD (n=2)
  - Disease of mineral metabolism (n=1)
  - Male (n=1)
  - Loss of follow up (n=3)
- Finally 84 women (Mean age: 56 yr, Range: 32-80) with CTS were analyzed

Evaluation of VD level, Severity
- Evaluated preoperatively for serum 25(OH)D using Diels-Alder derivatization and ultrahigh-performance liquid chromatography-tandem mass spectrometry
- Deficient < 20.0 ng/mL
- Non-deficient ≥ 20.0 ng/mL
- Insufficient : 20.0~30.0
- Sufficient > 30.0 ng/mL

Evaluation of VD level, Severity
- Symptom severity (DASH), electrophysiologic severity, and grip & pinch strength preoperatively (at baseline) and 6 months

Postoperative follow up
- 15 patients with VD deficiency at baseline, we routinely supplemented 1000 IU of VD daily for 6 months postoperatively

Statistical analysis
- 2 groups at 6 months
  - VD non-deficient (≥20 ng/mL)
  - Still VD deficient (<20 ng/mL) at 6 months
- Independent t-test for cont’ values
- Comparison of assessed parameters, DASH score, MCV, Grip & Pinch
- Comparison of pre- and postoperative : paired t-test

Results

VD level
- Initial: 12.3±3.5 (range: 5.9~18.8)
- Postop. 6M: 28.8±5.9 (range: 20.1~40.6)
- VD insufficient : 39 (47%)
- VD sufficient : 20 (23%)
- VD deficient : 25 (30%)
- No significant difference in baseline VD levels btw the patients who became VD non-deficient and patients who were still VD deficient (12.3 vs. 11.3, P = 0.260)

Comparison of patients with and without vitamin D deficiency at 6 months

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<th>VD non-deficient at % (N = 39)</th>
<th>VD deficient at % (N = 25)</th>
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<td>Symptom severity (DASH)</td>
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Comparison of patients with and without vitamin D deficiency at 6 months

- No significant difference in baseline VD levels btw the patients who became VD non-deficient and patients who were still VD deficient (12.3 vs. 11.3, P = 0.260)


data table

- After 6 months of daily supplementation of 1000 IU, 25 patients (30 %) were still VD deficient.
- Mean VD level (24.5 ng/mL) at 6 months still inadequate since the optimal level is over 30 ng/mL
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- 1600 IU/day was required
- In a study in Korean women with osteoporosis, 44% of VD deficient patients did not attain the optimal level of 30 ng/mL despite the intake of vitamin D 1000 IU/d
- But, DASH change did not differ btw those with sufficient and insufficient
- VD may also affect neuronal plasticity processes, such as axogenesis
- Electrophysiological improvement is often delayed or is not evident

Discussions

Summary
- Correction of VD deficiency is helpful for better surgical outcome in women with CTS

Shurr et al. 1986

Taniure et al. 2006

Shurr et al. 1986