

# TRANSCUTANEOUS ELECTRICAL MUSCLE STIMULATION: AN EFFECTIVE TREATMENT FOR SYMPTOMATIC PERIPHERAL NEUROPATHY IN HEMODIALYSIS PATIENTS



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## OBJECTIVES

It has been shown that the Transcutaneous Electrical Muscle Stimulation (TEMS) may have a positive effect on diabetic peripheral neuropathy. Among dialysis patients with diabetes mellitus, the diabetic neuropathy is common condition. At the same time, patients with end-stage renal disease are often suffering from uremic polyneuropathy, which is characterized by the common neuropathic symptoms: muscle pain, burning sensation, paresthesia, numbness. The aim of this study was to evaluate the effectiveness of TEMS in the treatment of symptomatic peripheral polyneuropathy in hemodialysis patients.

## METHODS

53 hemodialysis patients with symptoms and signs of peripheral neuropathy were randomized to the TEMS treatment group (N=29) or control group (CG, N=24). The number of patients with diabetes mellitus was equal in groups (N=3 in each group). For the TEMS treatments, an alternating electrical stimulation frequency from 6 to 35 Hz was used. TEMS was performed on quadriceps and calf muscles, during hemodialysis sessions, 3 times per week for 12 weeks. The CG received usual care with routine hemodialysis treatment. The neuropathy symptoms were evaluated using the Total Symptom Score (TSS) scale. In addition, the vibration perception threshold (VPT) was measured by 64 Hz graduated Rydel-Seiffer tuning fork on ankles and big toes. The TSS and VPT were evaluated at the start and after 12 weeks of study.

## RESULTS

The two treatment groups were similar in terms of baseline characteristics. The TEMS procedures were well tolerated. The compliance level was near 85%. TEMS treatment resulted in a significant improvement in TSS (from  $5,9 \pm 2,6$  to  $3,6 \pm 2,4$  in the TEMS group, from  $5,9 \pm 2,9$  to  $5,8 \pm 3,2$  in the CG;  $p < 0.001$  for effect size; Fig. 1). From separate TSS scales the most improvement was observed in pain score. In the TEMS group, score of the VPT significantly decreased after treatment, while in the CG there were no significant changes (from  $5,2 \pm 2,1$  to  $3,4 \pm 1,7$  in the TEMS group, from  $5,0 \pm 2,1$  to  $4,9 \pm 2,2$  in the CG;  $p < 0.001$  for effect size; Fig. 2)

Fig. 1. The Total Symptom Score dynamic, point

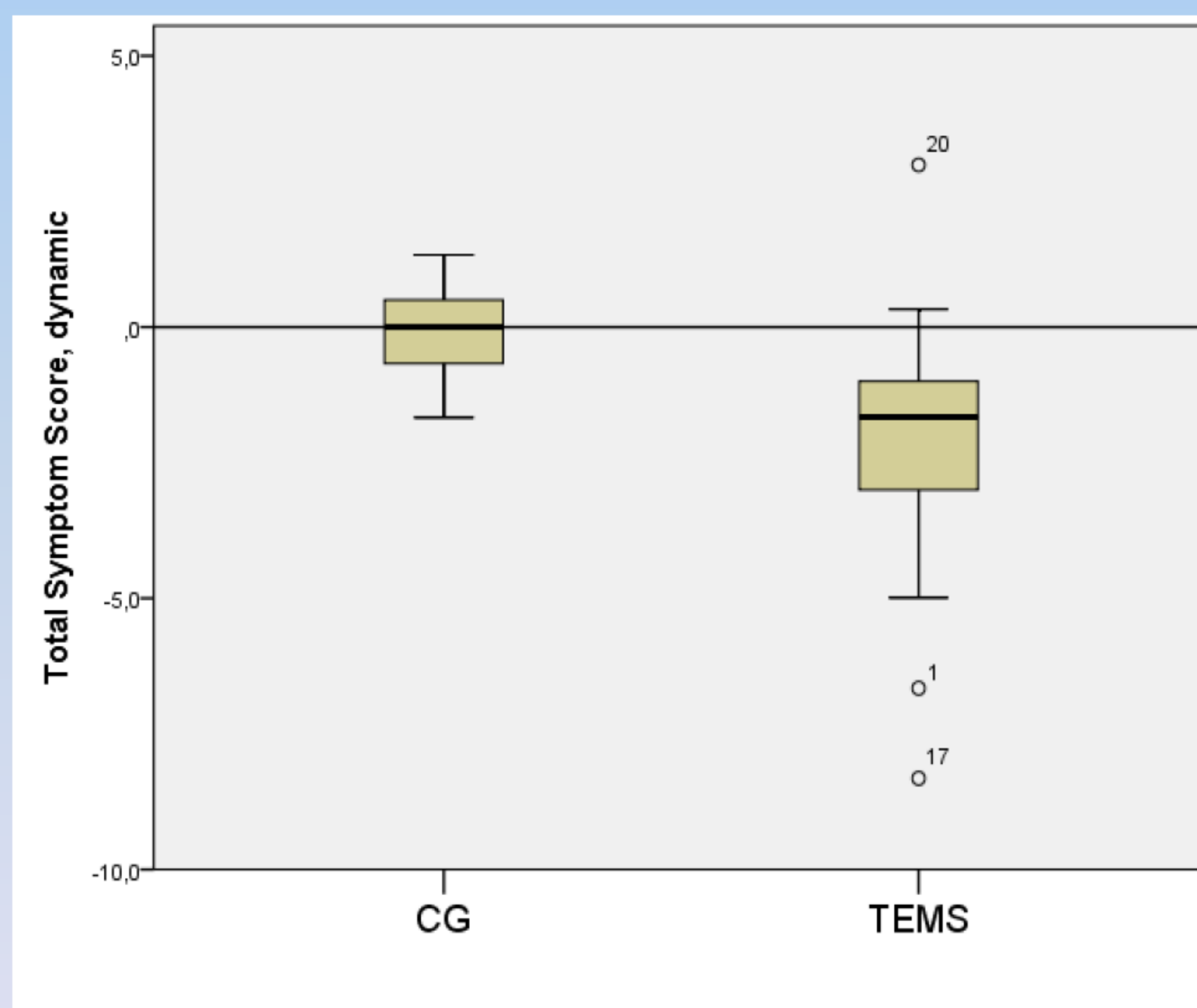
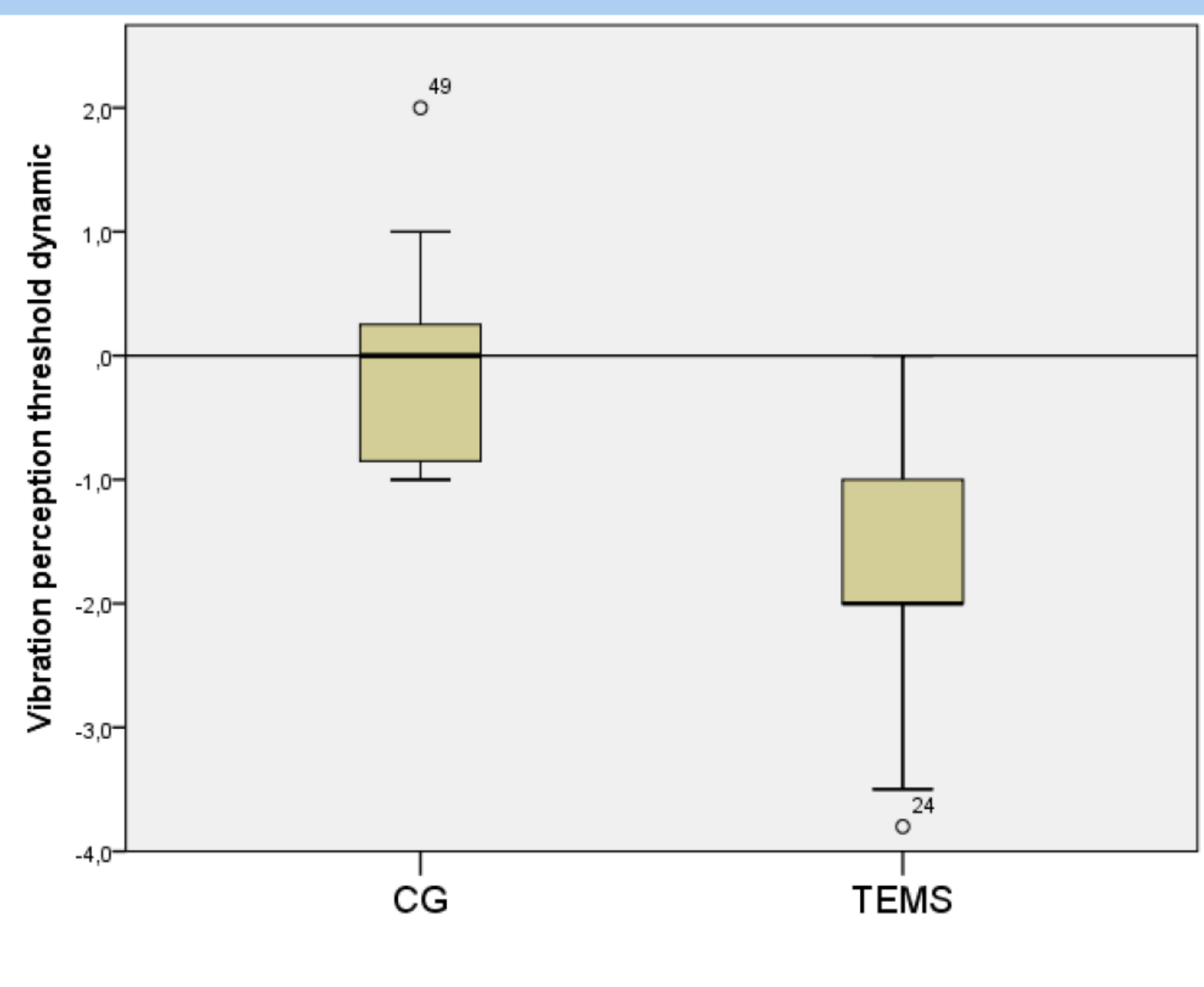


Fig. 2. The vibration perception threshold dynamic, points



## CONCLUSIONS

Our study suggests that intradialysis TEMS procedures are effective in treatment of the symptomatic peripheral neuropathy for hemodialysis patients and could be a potential non-pharmacological treatment option of this condition.

## REFERENCES:

Reichstein L. et al. Diabetologia 2005; 48(5):824-8

