

Efficacy of Acupuncture on Pain Severity and Frequency of Calf Cramps in Dialysis Patients: a Randomized Clinical Trial

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Background: Patients with chronic kidney disease, as a common disorder, usually necessitate the implementation of hemodialysis. Muscle cramps are one of the most disabling complications affecting their quality of life.

Objectives: We aimed to investigate the efficacy of acupuncture as a safe alternative to the management of pain severity and frequency of calf cramps in dialysis patients compared to a control group.

Methods: Fifty dialysis patients experiencing calf cramps who met the eligibility criteria were randomly allocated to two groups. Group A received routine management, including analgesic consumption, stretching exercises, and nine acupuncture sessions, including acupoints BL57, GV26, CV4, CV6, LV3, KI 1, LU7, LU9, and GB34. Group B underwent sham acupuncture therapy at locations other than the primary acupoints in addition to following the specified routine management. The pain severity was measured using the visual analog scale (VAS), and the daily frequency of calf cramps was evaluated at baseline and one month after treatment completion.

Results: VAS scores and the frequency of calf cramps were improved one month after treatment completion in both groups. However, the improvement was significant in group A ($p < 0.001$), while it was not statistically significant in group B ($p > 0.05$). There was also a significant difference between both groups regarding reducing pain and the frequency of calf cramps, which showed the efficacy of acupuncture compared to the control group ($p < 0.0001$).

Conclusion: Acupuncture can decrease pain and frequency of calf cramps in dialysis patients.

Keywords: Acupuncture, Chronic kidney disease, Hemodialysis, Muscle cramp

INTRODUCTION

Chronic Kidney Disease (CKD) is a global health concern, affecting millions of people worldwide. Individuals suffering from CKD often require hemodialysis, an essential therapeutic modality [1]. Regrettably, this life-sustaining procedure is often accompanied by a myriad of complications, including the occurrence of muscle cramps and pain [2]. Muscle cramps are involuntary, painful contractions of

skeletal muscles that can significantly impact the quality of life for CKD patients undergoing dialysis [3]. Pain is also a common symptom in CKD patients, with a prevalence of 40-60% in those undergoing hemodialysis [4]. The exact etiology of muscle cramps and pain in CKD patients is not fully understood, but it is believed to be multifactorial, involving factors such as electrolyte imbalances, volume depletion, and nerve dysfunction [5].

Current treatments for muscle cramps and pain in CKD

puncture stimulates the release of endogenous opioids, which are known to have analgesic effects [22]. Besides, acupuncture may modulate the activity of the autonomic nervous system, thereby reducing muscle cramps and pain [23].

Another potential explanation for the observed effects of acupuncture on muscle cramps in CKD dialysis patients is the improvement of microcirculation. A study by Zhang et al. found that acupuncture improved microcirculation in the lower extremities of hemodialysis patients, which could contribute to reducing muscle cramps [24]. Acupuncture has also been shown to have anti-inflammatory effects, which may also play a role in alleviating muscle cramps and pain in CKD dialysis patients [25].

Acupuncture has several advantages over other non-pharmacological interventions for muscle cramps in CKD dialysis patients. For instance, a study by Miller et al. [26] found that stretching exercises effectively reduced muscle cramps in dialysis patients. However, acupuncture may be more convenient and less time-consuming for patients, as it can be performed during dialysis sessions [27]. In addition, acupuncture has been shown to have fewer side effects compared to pharmacological treatments for muscle cramps, such as quinine [6].

The present study's methodology was robust, with a well-defined intervention and control group. The randomization process ensured no significant differences in demographic characteristics between the two groups, strengthening the validity of the results.

1. Study limitations

It is important to note that the sample size was relatively small, which might limit the generalizability of the findings. Future studies with larger sample sizes would be needed to confirm the results of this study. Another limitation was a relatively short follow-up duration. Further investigations with extended follow-up periods would be necessary to evaluate acupuncture's short-term and long-term effects in such patients. The lack of investigation of mineral and vitamin deficiencies, which could be predisposing factors for muscle cramps, was another limitation of this study. Moreover, the assessment of calf cramps primarily relied on subjective measures, specifically the participants' self-reported pain intensity and frequency. Supplementing these subjective measures with objective techniques such as electromyography or muscle tension recordings could have yielded more precise and quantitative data regarding the impact of acupuncture on calf cramps. Finally, the inability to analyze the data from patients with poor follow-up could be another limitation. Further study with less missing data would be suggested as well.

In conclusion, the present clinical trial demonstrated

that acupuncture effectively reduced calf cramps and pain in dialysis patients. These findings were consistent with previous research and supported the use of acupuncture as a safe and effective non-pharmacological intervention for muscle cramps in this patient population. Further research would be needed to confirm these findings and elucidate the underlying mechanisms of acupuncture's effects on muscle cramps and pain in dialysis patients.

CONCLUSIONS

Acupuncture had more efficacy in decreasing pain severity and frequency of calf cramps among dialysis patients compared to sham acupuncture therapy. It could be a safe and cost-beneficial alternative to management in such patients.

SUPPLEMENTARY MATERIAL

Supplementary data to this article can be found online at <https://doi.org/10.51507/j.jams.2024.17.2.47>.

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AUTHORS' CONTRIBUTIONS

All authors had equal contribution in all aspects of this research.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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