ABSTRACT

Background

Primary palmar hyperhidrosis is a chronic autonomic disorder characterized by excessive sweating beyond physiological thermoregulatory requirements. The condition significantly affects occupational performance, social interaction, emotional well-being, hand function, and overall quality of life. Iontophoresis is considered one of the safest and most effective non-invasive treatment modalities for palmoplantar hyperhidrosis. However, variability in therapeutic outcomes has been associated with differences in conductive media used during treatment.

Aim

To compare the effectiveness of sodium bicarbonate iontophoresis and normal saline iontophoresis in individuals with primary palmar hyperhidrosis.

Methodology

A randomized controlled trial with a three-arm parallel group design was conducted among 72 participants diagnosed with primary palmar hyperhidrosis. Participants were randomly allocated into Group A: Tap water iontophoresis, Group B: Tap water with normal saline iontophoresis, Group C: Tap water with sodium bicarbonate iontophoresis.

Intervention was administered three times weekly for four weeks. Primary outcome measures included gravimetric sweat measurement and Hyperhidrosis Disease Severity Scale (HDSS). Statistical analysis included Shapiro–Wilk test, repeated-measures ANOVA, paired t-test, and Tukey post-hoc analysis.

Results

All intervention groups demonstrated statistically significant improvement in gravimetric sweat reduction and HDSS scores following intervention ($p < 0.001$). Sodium bicarbonate iontophoresis demonstrated slightly greater numerical sweat reduction compared with saline and tap water iontophoresis; however, between-group differences were not statistically significant.

Conclusion

Iontophoresis is an effective and safe non-invasive treatment modality for primary palmar hyperhidrosis. Conductive additives such as sodium bicarbonate and normal saline may improve treatment effectiveness by enhancing electrical conductivity and sweat gland modulation.

Keywords

Primary palmar hyperhidrosis, iontophoresis, sodium bicarbonate, saline iontophoresis, gravimetric analysis, HDSS.

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