EFFICACY OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS) IN KNEE OSTEOARTHRITIS: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

Andreea-Daniela Pălăștea

SRRM Romania, Romania
e-mail: andipalastea@gmail.com

Background and Aims

Knee osteoarthritis (OA) is a progressive, degenerative condition marked by joint pain, stiffness, and limited function, heavily impacting quality of life. Its prevalence is increasing due to aging populations, obesity, and sedentary habits, with projections indicating it may become the leading global cause of disability by 2030. TENS (Transcutaneous Electrical Nerve Stimulation) has been proposed as a non-invasive method for pain management in OA, though current guidelines (e.g., ACR 2019) no longer recommend its use due to inconclusive efficacy data.

Methods

This meta-analysis included six randomized controlled trials (2008–2021) assessing TENS efficacy in knee OA, with diverse patient populations and variable methodological quality. Studies analyzed pain relief and joint function outcomes using tools such as WOMAC, VAS, and functional performance tests. Statistical heterogeneity was measured (I^2 = 81%), and analyses included funnel and forest plots to assess study bias and effect size consistency

Results

Results were mixed. TENS showed modest short-term benefits in early-stage OA (Kellgren-Lawrence grade 0–1), particularly in functional performance tasks like the 6-minute walk test and stair climb test. However, in patients with radiographic OA (grade ≥2), TENS was not superior to placebo for pain relief or functional improvement. Some studies noted placebo effects, and others highlighted benefits only when TENS was combined with acupuncture. No significant adverse effects were reported.

Conclusion

TENS may provide limited benefit in early-stage OA but lacks therapeutic advantage in moderate-to-severe cases. Findings support current guidelines advising against routine TENS use in knee OA. Further high-quality, double-blind trials are needed to clarify TENS's role, particularly in early intervention contexts

Keywords: osteoarthritis, knee, pain, metaanalysis, TENS