FROM SKIN TO NERVES: A REVIEW OF SUDOSCAN IN POLYNEUROPATHY DETECTION

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Background and Aims

Polyneuropathies are conditions characterized by peripheral nerve damage, leading to distal sensory alterations, pain, and muscle weakness. Some also involve autonomic fiber impairment, affecting sudomotor function. Sudomotor dysfunction (SMD) results from damage to small-diameter nerve fibers, such as unmyelinated C fibers of the autonomic nervous system, leading to abnormal sweat production. Reduced sweat production can compromise skin hydration and increase the risk of lesions, particularly in diabetic patients. Early detection of peripheral nervous system (PNS) alterations is crucial to preventing severe complications. This review examines the literature on electrochemical skin conductance (ESC) and Sudoscan test in evaluating sudomotor dysfunction across clinical contexts.

Methods

A literature review was conducted in the PubMed and Cochrane databases using keywords and their corresponding MeSH terms, including "Sudoscan," "Autonomic Nervous System Diseases," and "Electrodiagnosis". The search focused on systematic reviews, meta-analyses and randomized clinical trials from the past 10 years that addressed the sensitivity, specificity and clinical utility of these techniques for autonomic neuropathy detection. Studies evaluating ESC measurements against established peripheral neuropathy diagnostic criteria were included.

Results

ESC has been introduced as a non-invasive method for assessing sudomotor function by measuring the skin galvanic response to a low-intensity electric current. Sudoscan test provides a sensitive and specific evaluation of sympathetic innervation in sweat glands, making it a valuable tool for early SMD detection. Its use can offer an accessible and efficient alternative for diagnosing autonomic neuropathy. Studies suggest that ESC, when combined with other diagnostic tools, enhances early detection and management of peripheral neuropathies, allowing for more effective interventions.

Conclusion

A thorough analysis of existing studies highlights the potential of these techniques in clinical practice, their limitations and future directions for improving the diagnosis and management of autonomic neuropathies.

Keywords: Autonomic dysfunction, Polyneuropathy, Sudoscan