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TITLE Does cutaneous microvascular disease affect diabetes-related foot ulcer healing?: A Systematic Review

AUTHORS Miss Ally McIllhatton, Dr Sean Lanting, Prof Vivienne Chuter

EMAIL ally.mcillhatton@uon.edu.au **INSTITUTION** University of Newcastle

ABSTRACT (maximum 450 words. Please use the following or similar headings: Background/Methods/Results/Conclusions)

Background

While microvascular disease is recognised as a contributing factor in the development of diabetes-related foot ulcers (DFUs), its influence on healing outcomes remains uncertain. This systematic review aimed to evaluate whether measures of cutaneous microvascular function, or combined micro- and macrovascular assessments, can predict DFU healing.

Materials and Methods

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement and verified using the AMSTAR tool and was registered prospectively in the International Prospective Register of Systematic Reviews (PROSPERO ID: CRD4202564067). We searched the MEDLINE and EMBASE databases for prospective studies investigating measures of microvascular blood flow (e.g. laser Doppler) or commonly used mixed measures of micro and macrovascular flow (e.g. skin perfusion pressure and transcutaneous oxygen pressure) and diabetes-related foot ulcer (DFU) healing outcomes. A search was conducted from 1980 to present to determine the microvascular function and/or mixed microvascular and macrovascular function in healed and non-healed DFU groups.

Results

The search retrieved 2,344 articles, of which 17 were eligible for inclusion. The included studies reported on 1,211 participants, with an active DFU. Varied interventions and methods were used to determine cutaneous microvascular and mixed measure status pre- and post- intervention. Micro- or mixed micro/macrovascular measures included TcPO2 (n=10), SPP (n=5), LDF (n=3), and laser speckle contrast imaging (LSCI) (n=1) Meta-analysis was not possible due to heterogeneity of included studies. Synthesis of results suggest that individuals with higher baseline cutaneous microvascular flow or who experience an improvement in microvascular flow after revascularization or amputation intervention have a greater likelihood of successful wound healing.

Conclusion

Improved cutaneous microvascular flow is associated with better healing outcomes in participants with DFUs, whereas impaired flow is typically linked to poorer healing outcomes