



Non-pharmacological interventions to improve cardiovascular risk factors in people with diabetic foot disease: A systematic review and meta-analysis

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ABSTRACT

Cardiovascular disease (CVD) risk in those with diabetic foot disease is very high. Non-pharmacological interventions may improve this risk, though no previous evidence synthesis has been completed. This systematic review aimed to investigate the impact of non-pharmacological interventions on CVD risk factors in diabetic ulcer disease.

Multiple databases and trials registers were searched from inception to December 6th 2023. We included reports of randomised controlled trials investigating the impact of non-pharmacological interventions on cardiovascular risk in those with type 1 or type 2 diabetes and current or previous diabetic foot disease. Twenty studies were included. Extracted data included: study design and setting; participant sociodemographic factors; and change in cardiovascular risk factors. Data were synthesised using random effects meta-analyses and narrative syntheses.

Interventions included nutritional supplementation, collaborative care, hyperbaric oxygen therapy, patient education, nurse-led intervention, self-management, family support, relaxation and exercise, over a median duration of 12 weeks. Significant post-intervention changes were observed in fasting plasma glucose, serum insulin levels, insulin sensitivity and resistance, glycated haemoglobin, triglycerides, total cholesterol, low-density lipoprotein-cholesterol and C-reactive protein. No effects were detected in very low- or high-density lipoprotein-cholesterol or body mass index.

Non-pharmacological interventions show promise in improving CVD risk in diabetic foot disease.

1. Introduction

Diabetic foot disease (DFD), defined as infection, ulceration or destruction of tissues of the foot of a person with currently or previously diagnosed diabetes mellitus [1], is life-changing, common, and associated with persistent suboptimal control of glycaemia [2]. In England, it is estimated that approximately 58,000 people with diabetes experience

at least one new diabetic foot ulcer each year [3], and five-year survival in is worse than many cancers at approximately 40 % [4].

Those with DFD exhibit an extremely high degree of cardiovascular risk, greater than in those with diabetes alone [5], and cardiovascular disease (CVD) mortality is the leading cause of death in this population [6]. Reasons for increased risk include cardiac autonomic neuropathy [7], atherosclerotic disease acceleration, imposed physical inactivity

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