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Short Communication

Benefits of Buerger-Allen Exercises for Diabetic People. A Mini-Review

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Abstract

Diabetic people suffer from serious micro-and macrovascular complications of the disease with negative impacts on circulation and sensation of the lower extremities. Pharmacological therapy alone could be insufficient to prevent or treat these health problems and patients may need complementary therapy. Exercise therapy is a fundamental component of the management plan of diabetes mellitus and can augment drug treatment. Buerger- Allen exercise has recently been an evidence-based form of exercise for improving peripheral circulation in diabetic subjects. In this mini-review, the clinical benefits of Buerger-Allen exercises will be briefly mentioned.

Keywords: buerger-allen exercise; diabetes mellitus; clinical benefits; circulation

Introduction

Patients with diabetes mellitus, particularly those with low glycemic control, commonly have impaired lower limb circulation and an increased risk for foot ulcers, gangrene, or amputation. Buerger-Allen Exercise can improve peripheral circulation in patients with diabetes mellitus [1]. Buerger-Allen exercise was first described by Leo Buerger in 1926 and it was later modified by Arthur Allen in 1930 [2]. Buerger-Allen exercises are active postural exercises in which gravity alternatively empties and fills the blood vessels for promoting circulation in the lower limbs [3]. Buerger-Allen exercise comprises several stages as follows: (a) The patient lies supine with the leg elevated 45° and 60 ° using a pillow and performs ankle movement for 3 minutes or till blanching occurs; (b) The patient sits on the edge of the bed with their feet dangling over the edge of the bed and performs dorsiflexion & plantar flexion, and moving the legs in and out for 3 minutes; (c) The patient lies in the supine position covered with a blanket for 3 minutes [4]. The whole cycle can be repeated 3 to 6 times each session and each session can be repeated 3 times per day [4]. Impairment of circulation in the lower extremities can be detected by measuring the ankle-brachial index (ABI), a standard non-invasive method for assessing lower limb circulation, which is the ratio of the higher of the systolic blood pressures of either the dorsalis pedis or the anterior tibial artery and the higher of the two systolic blood pressures of the upper limbs [5]. Abnormal circulation can be detected when the ABI value is below 0.90 and severe circulatory impairment is detected when the ABI is below 0.4 [5]. However, in patients with diabetes and those receiving renal dialysis, the ABI may be an invalid method due to the presence of arterial calcification, and the toe-brachial index should be used instead in such cases.

Discussion

The clinical benefits of Buerger-Allen exercises can be listed as follows: (a) A reduction of the risk of neuropathy in diabetic patients [6]; (b) A reduction of the symptoms of peripheral neuropathy in patients with diabetes mellitus

[7]; (c) An increased ankle-brachial index (ABI) in diabetic subjects [8]; (d) A decrease in capillary refill time in the lower extremities of diabetic patients [9]; (e) Improvements in peripheral pulses, temperature, and skin color in patients with type 2 Diabetes Mellitus [9]; (f) An increase in the peripheral circulation in patients with diabetic foot ulceration, as evidenced by increased skin perfusion pressure [10]; (g) An improvement in wound condition in diabetic patients with foot ulceration [11]; (h) An increased peripheral oxyhemoglobin which is needed for proper healing in patients with diabetic foot ulceration [12]. The mechanism of Buerger-Allen exercises involves the use of gravity to alternately empty and fill the blood columns through blood vessels of the lower limb [2]. The advantages of

Buerger-Allen exercises can include easiness of application and learning, safety, no cost, suitability for home care programs, less physically demanding, and time-efficient.

Conclusion

Having multiple benefits and advantages, Buerger-Allen exercises can be of clinical importance for diabetic subjects who have an impairment in blood flow to the lower extremities and/or peripheral neuropathy. Clinicians and other health professionals dealing with diabetic subjects may consider the implementation of Buerger-Allen exercises in the management plan of diabetes mellitus.

Conflict of interest

The authors declare no conflict of interest

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