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Research Article

Effect of the Auricular Acupoint Associated with Physical Exercise in Elderly People: A Randomized Clinical Test

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Abstract
Objective: To analyze the effect of auricular acupoint associated with physical exercise on balance, mobility, and fear of falling in the elderly.
Method: The study is characterized as a clinical, controlled, and randomized trial with 22 elderly people divided into two groups: kinesiotherapy group (n = 11) and kinesiotherapy/auriculotherapy group (n = 11). The instruments used for evaluation were Falls Efficacy Scale International; Berg Balance Scale, and Timed up and Go Test. The intervention was performed with frequency 2×/week for 8 weeks. In the kinesiotherapy/auriculotherapy group, in addition to kinesiotherapy, auriculotherapy was applied in specific acupoints. All variables were analyzed by the Shapiro–Wilk test, and for comparison, analysis of variance was used for repeated measures of two factors.
Results: There was a significant intragroup reduction for the Timed up and Go Test ($p = 0.00$) and Falls Efficacy Scale International ($p = 0.00$), and significant intragroup Berg Balance Scale ($p = 0.00$) for both groups.
Conclusion: The auricular acupoint did not influence the balance, mobility, and fear of falling in the elderly studied.

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1. Introduction

The elderly face numerous limitations, with an increase in life expectancy, negatively affecting the quality of life and overall health status [1]. Decreased mobility and balance associated with fear of falling can lead to functional decline in the elderly community [2].

Falling in the elderly has become one of the major public health problems because of increased morbidity, mortality, and costs for the family and for society [1,3]. In Brazil, the systematic review, carried out between 2003 and 2012, highlights a high prevalence and incidence of falls in institutionalized elderly people and in the community; falls are considered multifactorial, recurrent, and often underestimated by the elderly, representing a significant risk of death or disabling for activities of daily living [4]. The main risk factors for falls in this population are related to functional limitation, previous history of falls, increased age, muscle weakness, use of psychotropic medications, environmental risks, and sensory deficits [2,5,6].

The aging process compromises the ability of the central nervous system to process sensory information from the vestibular, visual, and somatosensory systems, responsible for maintaining balance and decreasing the capacity of adaptive reactions, thus limiting the elderly person's activities of daily life [7]. To prevent falls, it is necessary to have good conditions to receive afferent information (vestibular, visual, and somatosensory systems) and efferent information (muscles) to maintain balance; one of the means capable of stimulating this information is the practice of physical exercises [7].

Inactivity is a strong predictor of physical disability in the elderly; however, longitudinal studies suggest that regular physical activity is associated with reduced mortality and prevents or improves the underlying conditions of disability in the elderly, including falls, hip fractures, cardiovascular disease, and diabetes [8,9,10].

The American College of Sports Medicine's position states that participation in regular physical activity causes a number of favorable responses that contribute to healthy aging [11]. In this sense, physical exercise has demonstrated its beneficial effects such as reduced frailty, number of falls, decreased cognitive function, decreased cardiac and pulmonary function, decreased physical function such as balance, gait, and mobility, and decreased muscle power and functional capacity [12].

On the other hand, there are alternative and complementary health therapies that can also aid in healthy aging [13,14]. Experimental studies in rats that used acupuncture were able to slow down the aging process by regulating the expression of various genes by strengthening inflammatory and immune functions as well as protecting cells and inhibiting apoptosis and anti-oxidative stress [13,14]. In studies in humans, the application of acupuncture was able to influence postural balance in healthy individuals [15] and improve postural control in the elderly [3].

Among the alternative and complementary health therapies, auriculotherapy stands out, which can be defined as a system of diagnosis and treatment based on the regulation of the dysfunctions that affect the body, stimulating points located in the ear. These points are called acupoints and when stimulated produce biochemical and functional responses to treat various physical and mental diseases [16–19].

It has been shown by some researchers that dermal stimulation of various parts of the body activate respective areas of the cerebral cortex [20], modifications in electroencephalographic patterns [21], hemodynamic changes observed by functional resonance [22] after application of acupuncture at specific points of the body, and also modulations of neurotransmitter responses [23].

To date, there is much scientific evidence on the effect of physical exercise to slow down the aging process [24,25]. However, there is little evidence about the effect of auriculotherapy for improved balance [3] being observed in studies with scalp acupuncture in stroke patients [26], as well as improved performance and recovery after exercise [27]. Until this day, existing research has used auriculotherapy, systemic acupuncture, and physical exercise in an isolated form, and in some studies, the authors highlight the small sample size with inconsistent results [3,10,15].

Thus, the objective of this study was to investigate the effect of auricular acupoint associated with physical exercise on balance, mobility, and fear of falling in the elderly.

2. Methodology

2.1. Study design

This study is characterized by a randomized controlled clinical trial. All participants agreed to participate in the Q6 Q7 study by signing the free and informed consent term following the guidelines of CONEP Resolution 466/12 with the approval of the Ethics and Research Committee of the University ..... under the 39554314.7.0000.5102.

2.2. Sample

The participant recruitment occurred between the period November 2014 and April 2015. Seventy-two elderly community members were recruited from the primary health-care unit of a city in the south of Minas Gerais and were invited to participate in the study. From this recruitment, 50 elderly people did not meet the inclusion criteria: the elderly of both genders aged over 60 years, practicing physical activity (twice a week during an hour), with a history of at least one fall in the last year, and with preserved visual and auditory acuity. Also excluded were the elderly with disabling musculoskeletal and neurological conditions and cognitive deficits (analyzed by the Mini-Mental State Test).Twenty-two elderly people of the community remained in the study and were randomized blindly (using the Randomizer program—www.random.org) and allocated to two groups: intervention group—kinesiotherapy/auriculotherapy group (KAG, n = 11) and control group—kinesiotherapy group (KG, n = 11). There was a sample loss of one elderly person in KAG due to a prescheduled varicose vein removal surgery. See the Fig. 1.

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