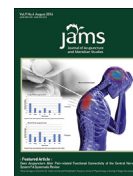


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Journal of Acupuncture and Meridian Studies

journal homepage: www.jams-kpi.com

Research Article

Effect of Auriculotherapy on the Plasma Concentration of Biomarkers in Individuals with Knee Osteoarthritis

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pISSN 2005-2901 eISSN 2093-8152

<https://doi.org/10.1016/j.jams.2018.05.005>

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Please cite this article in press as: Costa-Cavalcanti RG, et al., Effect of Auriculotherapy on the Plasma Concentration of Biomarkers in Individuals with Knee Osteoarthritis, Journal of Acupuncture and Meridian Studies (2018), <https://doi.org/10.1016/j.jams.2018.05.005>

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Available online ■ ■ ■

Received: Dec 26, 2017

Revised: Mar 30, 2018

Accepted: May 9, 2018

KEYWORDS

auriculotherapy;
biomarkers;
knee osteoarthritis

Abstract

Knee osteoarthritis (KOA) is one of the most frequent noncommunicable diseases with pain associated symptoms and affects the musculoskeletal system. Various forms of treatment can be indicated, and nonpharmacological treatment is also an available option for the management of KOA individuals. For instance, auriculotherapy (AT) is one possible procedure associated with the Traditional Chinese Medicine for dealing with KOA. It is believed that the concentration of certain biomarkers could be altered in individuals with KOA after AT. The aim of this study was to evaluate the effect of AT on plasma concentration of biomarkers in KOA individuals. This intervention is a controlled trial. Twenty-one subjects were grouped in two groups and submitted to AT with the stimulation of the *Shen Men*, kidney, and knee points in the treatment group or different points in the control group, once a week for 5 weeks. Blood was collected before the beginning of protocols and a week after the last session. Kolmogorov–Smirnov and Wilcoxon tests were performed, and a $p \leq 0.05$ was considered statistically significant. Hematological parameters did not show any significant variation between the control group and treated group. Concerning the biochemical parameters, a significant reduction of direct bilirubin (from 43.31 ± 22.10 to 21.21 ± 5.30 $\mu\text{mol/L}$, $p = 0.003$), aspartate aminotransferase (from 0.48 ± 0.16 to 0.38 ± 0.09 $\mu\text{Kat/L}$, $p = 0.010$), and triglycerides (from 7.04 ± 2.90 to 5.45 ± 2.57 mmol/L , $p = 0.008$) in the treated group was obtained. In conclusion, the analysis of results suggests that AT might be a useful intervention for the management of KOA individuals.

1. Introduction

Osteoarthritis (OA) is a degenerative joint disease [1] characterized by focal and progressive loss of the hyaline cartilage, associated with bony changes. Usually, it is defined by symptoms such as pain, swelling, and joint stiffness. Radiographs have been used to aid in the diagnosis of the osteoarthritis. Changes, including joint space narrowing, development of osteophytes, and bony sclerosis or a combination of these can be observed in the radiographic images. [2].

The increase of OA world prevalence is related to aging [3]; it affects 13.9% of adults aged 25 years and older and 33.6% of those older than 65 years [4]. Women had higher rates than men, especially those older than 60 years. The knee is the joint in the leg most commonly affected, and a clinical radiographic diagnosis requires (i) the presence of osteophytes, (ii) knee pain, and (iii) age > 50 years, joint stiffness < 30 minutes, or crepitus [5]. Although there are clinical, clinical plus laboratory, and clinical plus radiographic tests, there is no consensus about the best criteria for diagnosing OA in clinical practice.

Knee osteoarthritis (KOA) has a multifactorial etiology, and a cure is not known [6]. The knee pain is recognized as one of the characteristic symptoms that causes limitations in daily activities and is often the main complaint in clinical care [7]. Owing to high probability of unfavorable

prognosis, KOA should be diagnosed early and treated with either nonpharmacological or pharmacological procedures [1]; however, the clinical efficiency of agents like analgesic and antiinflammatory is limited, and the adverse effects are unwanted [8,9].

The main emphasis in KOA management is pain relief and function improvement, with minimal adverse effects. *American College of Rheumatology 2012 Recommendations* suggest conditionally the use of acupuncture, a technique of Traditional Chinese Medicine. Auriculotherapy (AT) is recommended when the patient with KOA has chronic moderate to severe pain and is a candidate for total knee arthroplasty, but is unwilling to undergo this procedure. Moreover, if the patient has comorbid medical conditions or is taking concomitant medications that lead to a relative or absolute contraindication to surgery or a decision by the surgeon not to recommend the procedure.

AT is a type of nonpharmacological therapy [9,10], usually performed with needles. It is reported to be effective in the treatment for reducing chronic pain caused by KOA because of its analgesic effect, besides being associated with improved functional mobility and quality of life [8]. AT is achieved by the stimulation of points in a specific anatomical region, in the case of ear. It may be performed, among other methods, with mustard seeds (*Semen vaccariae*). It may generate effects in specific parts of the body, due to the somatotopic organization of the ear with direct

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