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Decreased insulin resistance in diabetic patients by influencing Sirtuin1 and Fetuin-A following supplementation with ellagic acid: a randomized controlled trial

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Abstract

Background: The beneficial effects of polyphenols have been reported. This study aimed to investigate the effect of oral Ellagic acid (EA) supplement on insulin resistance (IR) and Fetuin-A and serum sirtuin1 (SIRT1) in type 2 diabetics.

Methods: In this double-blind, randomized clinical trial, 44 diabetic patients were selected. Patients were assigned to the intervention group (22 subjects) and placebo (22 subjects) and received a capsule containing 180 mg of EA per day or placebo for eight weeks, respectively. At the beginning and end of the study, anthropometric indices, fasting plasma glucose (FPG), plasma insulin level, IR, Fetuin-A, and SIRT1 were measured. Statistical analysis was performed using SPSS software.

Results: At the beginning and end of the study, there was no significant difference between the two groups regarding anthropometric indices ($P > 0.05$). At the end of the survey, EA supplementation significantly reduced FPG, insulin, IR, and Fetuin-A and increased SIRT1 levels compared with the placebo group ($P < 0.05$). However, these changes were not significant in the placebo group ($P > 0.05$).

Conclusion: EA with antioxidant properties plays an essential role in reducing the macrovascular and microvascular complications of diabetes by reducing inflammation and insulin resistance.

Trial registration The protocol of this clinical trial is registered with the Iranian Registry of Clinical Trials (<http://www.IRCT.IR>, identifier: IRCT20141025019669N13)

Keywords: Ellagic acid, Glycemic index, Insulin resistance, Diabetes type 2

Background

Diabetes mellitus is one of the five leading causes of death in the world, characterized by impaired insulin secretion, insulin activity, or both, and is divided into two categories: type 1 diabetes and type 2 diabetes [1]. Results of studies show that in 2030, 552 million people will have type 2 diabetes. Insulin function in diabetics and its subsequent resistance or sensitivity to insulin are the cases that, despite significant research and success in this field,

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