

World Congress on

Nutraceuticals and Natural Medicine

October 22-23, 2018 | Amsterdam, Netherlands

Effect of saffron aqueous extract and its carotenoids (crocin and crocetin) on plasma proteome pattern, expression of SIRT1/LOX1 genes and miRNA-223, and serum homocysteine levels in atherosclerotic patients



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Cardiovascular disease (CVD) is one of the most common causes of mortality worldwide, including Iran. Atherosclerotic plaque formation in heart arteries is the main reason for heart attack. Prevention of atherosclerosis is based on a strict management of the traditional risk factors of atherosclerosis such as smoking, diabetes, hyperlipidemia, and hypertension. Lifestyle, nutritional habits and complement therapy using phytochemicals, such as carotenoids and flavonoids were very effective in both prevention and treatment of atherosclerosis. Saffron is one of the traditional spices in Iran with several biological and therapeutic activities, which is full of carotenoids such as crocin and crocetin, and according to our traditional medicine its target organ is the heart. Previous *in vitro* and *in vivo* studies in model animals, in our lab and other research groups, indicated the effectiveness of saffron carotenoids in controlling the risk factors related to cardiovascular disease. But, according to our literature survey, there is no clinical trial directly conducted in the field of atherosclerosis. Thus, we will study the effect of saffron aqueous extract (SAE) and its carotenoids (crocin and crocetin) on the overall improvement measures, proteome patterns and expression of some specific genes in patients with atherosclerosis. In this double-blind case-control clinical trial, with consideration to inclusion and exclusion criteria, 60 atherosclerotic adult patients will be randomly divided into four groups (15

patients in each) that will receive, once a day, a capsule containing 30 mg SAE/ 30 mg crocin/ 10 mg crocetin/or placebo. Before and after 8 weeks, blood samples will be collected by venipuncture into the tubes coated with EDTA. A part of the plasma will be delaminated and be applied for two-dimensional gel electrophoresis. Then, the plasma proteome patterns of the patients before and after intervention will be compared using Melanie software and statistical analysis. The spots with a significant change will be compared with the standard proteome patterns for characterization and identification. The other part of plasma will be used for quantification of homocysteine levels using an ELISA kit. Peripheral blood mononuclear cells (PBMCs) will be isolated from whole blood of the patients and were used for total RNA extraction and cDNA synthesis, *LOX-1* gene, and *miRNA-223* expression will be determined using Real-Time PCR. The data obtained from all of the groups will be compared before and after intervention and with together and with the placebo group with suitable statistical analysis method(s).

Biography

Saeed Abedimanesh has completed his PhD in Clinical Biochemistry from Tarbiat Modares University, Tehran, Iran. His field of study is the purification of nutraceuticals and investigation on the health-promoting effects of them. He is the Founder and CEO of Aria Sarand Exir Company, his company produces high purity nutraceuticals and nutricosmetics for research, food additive, and herbal supplement uses. Betanin, crocetin, Crocin, picrocrocin, and indicaxanthin are the main products of his company.

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