

Cardiac Benefits of Black Seed Extract: Its Main Compound Thymoquinone Inhibits Ouabain-Induced Arrhythmia in Isolated Rat Atria

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Received date: November 25, 2021; Accepted date: December 01, 2021; Published date: December 10, 2021

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Background

Nigella sativa extract (NSE) and thymoquinone (TQ), the active ingredient of black seed (Nigella sativa L.) have shown to be of some benefits in cardiovascular diseases. In this study, we sought to investigate the mechanism of action of NSE and effect of TQ on obtain-induced arrhythmia in rats. The hearts of male rats divided randomly into several groups, rapidly removed after induction of anesthesia. The atrium was immersed in modified Krebs solution and TQ in organ bath connected to a force transducer. In another set of experiments, NSE was extracted from Nigella sativa L. plant and the methanol extract was used in presence of atropine, cyproheptadine and theophylline in organ bath. Time of onset of arrhythmia and asystole, atrial rate and contractile force were recorded and analyzed. This study indicated that TQ significantly postponed the time of onset of arrhythmia and asystole ($P \leq 0.001$). Obtain alone significantly increased the atrial beating rate and contractile force in controls ($P \leq 0.05$), whereas pretreatment with TQ reversed this effect. NSE decreased the force and rate of contractions of isolated rat atria dose-dependently ($P \leq 0.05$). Pretreatment with atropine, cyproheptadine, and theophylline in the presence of NSE indicated the involvement of cholinergic and serotonergic systems in the mechanism of action of NSE on the isolated rat atria. Based on our findings, NSE has a dose-dependent depressant effect on the heart possibly by direct acting on cholinergic and serotonergic systems, and the antiarrhythmic properties of its active constituent, TQ might be attributed to these system.

NS seeds and extracts have been shown to have beneficial effect on diabetes mellitus, insulin resistance syndrome, total lipid profile, and cardiovascular system, as well as antiplatelet actions. In addition, pretreatment with NS oil decreased cyclosporine A, cyclophosphamide, and

doxorubicin injury in animal heart. Black Cumin (Nigella sativa), which belongs to the botanical family of Ranunculaceae, commonly grows in Eastern Europe, the Middle East, and Western Asia. Its ripe fruit contains tiny black seeds, known as "Al-Habba Al-Sauda" and "Al-Habba Al-Barakah" in Arabic and black seed or black cumin in English. Seeds of Nigella sativa are frequently used in folk medicine in the Middle East and some Asian countries for the promotion of good health and the treatment of many ailments. However, data for the cardiovascular benefits of black cumin are not well-established. We reviewed the literature from 1960 to March 2012 by using the following key words: "Nigella sativa," "black seeds," and "thymoquinone." Herein, we discussed the most relevant articles to find out the role of Nigella sativa in the cardiovascular diseases spectrum especially when there is a paucity of information and need of further studies in human to establish the utility of Nigella sativa in cardiovascular system protection.

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