

## Original Article

# The effects of cinnamon supplementation on blood lipid concentrations: A systematic review and meta-analysis

Serban M. Maiercan, Maria-Corina Serban, MD, PhD, Amirhossein Sahebkar, PharmD, PhD, Sorin Ursoniu, MD, PhD, Alexandru Serban, PhD, Peter Penson, MPharm, PhD, Maciej Banach, MD, PhD\*, on behalf the Lipid and Blood Pressure Meta-analysis Collaboration (LBPMC) Group

*“Victor Babes” University of Medicine and Pharmacy, Timisoara, Timisoara, Romania (Dr Maiercan); Department of Functional Sciences, Pathophysiology, “Victor Babes” University of Medicine and Pharmacy, Timisoara, Timisoara, Romania (Dr M.C. Serban); Biotechnology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran (Dr Sahebkar); Metabolic Research Centre, Royal Perth Hospital, School of Medicine and Pharmacology, University of Western Australia, Perth, Australia (Dr Sahebkar); Department of Functional Sciences, Public Health, “Victor Babes” University of Medicine and Pharmacy, Timisoara, Timisoara, Romania (Dr Ursoniu); Department of Automation and Applied Informatics, University “Politehnica” Timisoara, Timisoara, Romania (Dr A. Serban); School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool, UK (Dr Penson); Department of Hypertension, Chair of Nephrology and Hypertension, Medical University of Lodz, Lodz, Poland (Dr Banach); Polish Mother’s Memorial Hospital Research Institute, Lodz, Poland (Dr Banach); and Cardiovascular Research Centre, University of Zielona-Gora, Zielona-Gora, Poland (Dr Banach)*

**KEYWORDS:**

Cinnamon;  
Cholesterol;  
Triglycerides;  
Lipid profiles;  
Nutraceuticals

**BACKGROUND:** Cinnamon is a rich botanical source of polyphenols, whose positive effects on blood lipid concentrations have been hypothesized, but have not been conclusively studied.

**OBJECTIVE:** The objective of the study was to systematically review and evaluate the effect of administration of cinnamon on blood lipid concentrations.

**METHODS:** We assessed 13 randomized controlled trials with 750 participants investigating the effect of cinnamon supplementation on blood lipid concentrations. A meta-analysis was performed using random effect models, with weighted mean differences (WMDs; with 95% confidence interval [CI]) for endpoints calculated using a random effects model.

**RESULTS:** No statistically significant effect of cinnamon was observed on blood low-density lipoprotein cholesterol (LDL-C; WMD:  $-0.16$  mmol/L [ $-6.19$  mg/dL], 95% CI:  $-0.35$ ,  $0.03$  [ $-13.53$ ,  $1.16$ ],  $P = .10$ ) and high-density lipoprotein cholesterol (HDL-C; WMD:  $0.05$  mmol/L [ $1.92$  mg/dL], 95% CI:  $-0.03$ ,  $0.12$  [ $-0.03$ ,  $4.64$ ],  $P = .21$ ) concentrations. However, a statistically significant reduction in blood triglycerides (WMD:  $-0.27$  mmol/L [ $-23.91$  mg/dL], 95% CI:  $-0.39$ ,  $-0.14$  [ $-34.54$ ,  $-12.40$ ],  $P < .01$ ) and total cholesterol concentrations (WMD:  $-0.36$  mmol/L

\* Corresponding author. Department of Hypertension, WAM University Hospital in Lodz, Medical University of Lodz, Zeromskiego 113; 90-549 Lodz, Poland.

E-mail address: [maciejbanach77@gmail.com](mailto:maciejbanach77@gmail.com)

Submitted June 7, 2016. Accepted for publication August 7, 2017.

[−13.92 mg/dL], 95% CI: −0.63, −0.09 [−24.36, −3.48],  $P < .01$ ) was observed. HDL-C was significantly elevated after the omission of 1 study (WMD: 0.04 mmol/L [1.54 mg/dL], 95% CI: 0.03, 0.06 [1.16, 2.32],  $P < .01$ ) during our sensitivity analysis. A meta-regression analysis was conducted, and no significant association was found between changes in lipid parameters and cinnamon dose. In contrast, changes in blood levels of total cholesterol (slope: 0.09; 95% CI: 0.02, 0.16;  $P < .01$ ), LDL-C (slope: 0.05; 95% CI: 0.001, 0.10;  $P = .05$ ) and triglycerides (slope: 0.06; 95% CI: 0.04, 0.09;  $P < .01$ ) were significantly and positively associated with the duration of supplementation. No statistically significant association was found between blood HDL-C changes and duration of supplementation.

**CONCLUSION:** Cinnamon supplementation significantly reduced blood triglycerides and total cholesterol concentrations without any significant effect on LDL-C and HDL-C.

© 2017 National Lipid Association. All rights reserved.

## Introduction

It is well known in current medical practice that blood lipids are associated with coronary heart disease, and that their blood levels are good indicators of cardiovascular risk and good predictors of coronary disease outcome.<sup>1</sup> Considering the association between blood lipid concentrations and cardiovascular disease, organic compounds like herbal polyphenols and other natural substances found in different plants may be potential adjuvants in the treatment of various cardiovascular pathologies and are being intensely studied.<sup>2</sup> In this regard, spices such as cinnamon are important because they are inexpensive, safe, and available globally.<sup>3</sup> Research into herbs and spices is made especially important because of the fact that recently, the United States Food and Drug Administration withdrew its approval for the combined use of a statin with extended-release niacin and extended-release fenofibric acid preparations for the treatment of various dyslipidemias.<sup>4</sup> The current limitation on effective combination therapy with statins enhances the importance of research into spices and other bioactives.

Cinnamon is extracted from the inner bark of trees from the genus *Cinnamomum* and belongs to the *Lauraceae* family widely spread in Asia, Australia, and South America.<sup>5</sup> It is largely consumed as a spice being considered harmless to ingest.<sup>6</sup> Because of its pharmacologic benefits, such as antibacterial and antioxidant properties, cinnamon is a significant element of the Chinese medicine.<sup>7</sup> The genus *Cinnamomum* contains 2 main species, *Cinnamomum zeylanicum* and *Cinnamomum cassia*, which has proven favorable antitumor and antioxidant effects.<sup>8</sup> The main difference between these 2 varieties is their coumarin (1,2-benzopyrone) content.<sup>9</sup> Otherwise, both plant species possesses many active substances in different proportions, mainly eugenol (leaf), cinnamaldehyde (bark), and camphor (root).<sup>10</sup> The antioxidant phenolic constituents of cinnamon extracts have been suggested to diminish oxidative stress, bear anti-inflammatory properties, and improve cognitive function in animals.<sup>11</sup> As an important natural source of polyphenols, cinnamon has also been found to aid in the regulation of blood glucose in humans in the systematic review of

randomized controlled trials<sup>12</sup> although the impact of cinnamon on blood lipids is still a controversial idea and the mechanism by which the cinnamon supplements potentially influence the level of blood lipids needs more clarification.

Accordingly, this meta-analysis reviewed a number of different randomized, placebo-controlled clinical trials, evaluating the effect of cinnamon on blood lipid concentration, specifically on different fractions of cholesterol and triglycerides, as they are important cardiovascular risk factors.

## Methods

### Search strategy

This study was designed according to the guidelines of the 2009 preferred reporting items for systematic reviews and meta-analysis statement. A systematic literature search was performed in SCOPUS, Embase, and MEDLINE databases. The search terms (in titles and abstracts) were (randomized controlled trials OR RCT OR randomized OR lipid OR total cholesterol OR LDL-cholesterol OR HDL-cholesterol OR triglycerides) and (cinnamon). The wild-card term “\*” was used to increase the sensitivity of the search strategy. The search was not limited to articles published in any specific language. The literature was searched from inception to date July 31, 2015.

### Study selection

The following criteria were used to identify eligible studies: (1) Randomized placebo controlled trials with either a simple or cross-over design; (2) investigation of the effects of any cinnamon species (*Genus cinnamomum*) or standardized cinnamon-enriched extracts on blood lipid concentrations; (3) providing sufficient information on baseline and end-trial blood lipid concentrations in both cinnamon and control groups. Exclusion criteria were (1) animal and observational studies; (2) uncontrolled studies; (3) administration of non-standardized extracts or extracts containing negligible amounts of cinnamon resulting in a

Download English Version:

<https://daneshyari.com/en/article/8668539>

Download Persian Version:

<https://daneshyari.com/article/8668539>

[Daneshyari.com](https://daneshyari.com)