

## CASE REPORT

# Potential Cholesterol-lowering and Antihypertensive Effects of Cinnamon Tea: A Single Case Study

S. Mohammed Nawaz<sup>1</sup>, Sivanandhini Murugesan<sup>2</sup>, K. Gayathri Devi<sup>3</sup>, Saravanan Mariappan<sup>4</sup>,  
Mahesh Kumar Kuppasamy<sup>5\*</sup>

<sup>1</sup>Yoga and Naturopathy Physician, Sivaraj Naturopathy and Yoga Medical College and Hospital, Salem, Tamil Nadu, India.

<sup>2</sup>Associate Professor, Department of Yoga, Sivaraj Naturopathy and Yoga Medical College and Hospital, Salem, Tamil Nadu, India.

<sup>3</sup>Assistant Professor, Department of Acupuncture and Energy Medicine, Sivaraj Naturopathy and Yoga Medical College and Hospital, Salem, Tamil Nadu, India.

<sup>4</sup>Principal, Department of Anatomy, Sivaraj Naturopathy and Yoga Medical College and Hospital, Salem, Tamil Nadu, India.

<sup>5</sup>Assistant Medical Officer/Lecturer Grade II, Department of Physiology, Government Yoga and Naturopathy Medical College & Hospital, The Tamil Nadu Dr. MGR Medical University, Chennai, Tamil Nadu, India.

### ARTICLE INFO

#### Article history:

Received on: 21-04-2024

Accepted on: 19-05-2024

Published on: 31-05-2024

#### Key words:

Herbal tea,  
Hypercholesterolemia,  
Hypertension,  
Naturopathy

### ABSTRACT

Hypercholesterolemia is a chronic cardiovascular condition characterized by high levels of cholesterol in the blood. Untreated hypercholesterolemia raises the risk of cardiovascular problems, necessitating effective treatment approaches. This single-case study evaluates the efficacy of *cinnamon* tea for a 52-year-old married man with high blood cholesterol (total cholesterol, triglycerides, low-density lipoprotein (LDL), and very-LDL). The patient presented with a history of head pain, elevated blood pressure (160/100 mmHg), and elevated blood triglyceride levels (232.6 mg/dL), diagnosed with hypertension and hypercholesterolemia. The patient was advised to consume a regular diet along with cinnamon tea for 2 months at the outpatient department of Sivaraj Naturopathy and Yoga Medical College and Hospital, Salem. Post-intervention assessments showed favorable outcomes, with a 70% symptomatic relief and a reduction in blood pressure from 160/100 mmHg to 140/90 mmHg. Notably, blood triglyceride levels decreased from 232.6 mg/dL to 176.4 mg/dL within 2 months. No serious adverse events were recorded. This single-case study reports the effectiveness of *cinnamon* tea in a patient with hypertension and hypercholesterolemia. The naturopathic diet with cinnamon tea demonstrated remarkable effects and changes in the recorded data. However, further large-scale studies with improved designs are needed to validate these findings.

## 1. INTRODUCTION

Hypercholesterolemia, characterized by elevated levels of cholesterol in the blood, is a major risk factor for cardiovascular diseases such as atherosclerosis, heart attacks, and strokes.<sup>[1]</sup> High cholesterol can be caused by factors such as unhealthy diet, obesity, lack of physical activity, smoking, diabetes, and genetic predisposition.<sup>[2]</sup> Conventional treatments for hypercholesterolemia include lipid-lowering medications such as statins, fibrates, bile acid sequestrants, and lifestyle modifications such as dietary changes and increased physical activity.<sup>[3]</sup> However, these treatments may have side effects or be ineffective in some cases, prompting the need to explore complementary and alternative therapies.

*Cinnamon*, a commonly used spice, has gained attention for its potential cholesterol-lowering effects due to its bioactive compounds such as cinnamaldehyde, cinnamate, and polyphenolic antioxidants. Several studies have investigated the efficacy of cinnamon supplementation in improving lipid profiles, with promising but mixed results.<sup>[4,5]</sup>

## 2. METHODS

This single-case study aimed to evaluate the effectiveness of *cinnamon* tea in managing hypercholesterolemia and associated conditions in a 52-year-old male patient.

### 2.1. Participant Selection

The participant was a 52-year-old married man diagnosed with hypercholesterolemia and hypertension at the outpatient department of Sivaraj Naturopathy and Yoga Medical College and Hospital, Salem. He presented with a history of head pain, elevated blood

#### Corresponding Author:

Dr. K. Maheshkumar, BNYS, M.Sc., PhD,

Assistant Medical Officer/Lecturer Grade II, Department of Physiology,  
Government Yoga and Naturopathy Medical College and Hospital,  
Chennai-600106, Tamil Nadu, India.

Email: [doctor.mahesh1985@gmail.com](mailto:doctor.mahesh1985@gmail.com)

pressure (160/100 mmHg), and high blood triglyceride levels (232.6 mg/dL).

## 2.2. Intervention

The participant was advised to consume a regular diet along with cinnamon tea for 2 months. The cinnamon tea was prepared by boiling 5 g of cinnamon bark and 15 g of jaggery in 200 ml of water until the volume was reduced to 100 mL. The participant consumed 100 ml of cinnamon tea in the morning (7 am–9 am) and evening (5 pm–7 pm) daily.

## 2.3. Outcome Measures

The primary outcome measures were blood cholesterol levels, including total cholesterol, triglycerides, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and very-LDL (VLDL). Blood pressure was also monitored as a secondary outcome measure. Blood samples were collected and analyzed using standard laboratory methods at baseline (October 11, 2023) and after 2 months of intervention (March 03, 2024). Blood pressure was measured using a sphygmomanometer at the same time points.

## 3. RESULTS

This single-case study investigated the effects of *cinnamon* tea consumption on blood cholesterol levels and blood pressure in a 52-year-old man with hypercholesterolemia and hypertension. After a 2-month intervention period of consuming 100 mL of *cinnamon* tea twice daily (morning and evening) along with a regular diet, remarkable improvements were observed. Most notably, the patient's elevated triglyceride levels decreased from 232.6 mg/dL to 176.4 mg/dL, a significant 24% reduction bringing levels into the normal range (<150 mg/dL). In addition, VLDL cholesterol decreased from 47 mg/dL to 35 mg/dL, now within the normal range of 80-130 mg/dL. While total cholesterol increased slightly from 162.4 mg/dL to 172.5 mg/dL post-intervention, it remained below 200 mg/dL. HDL and LDL cholesterol levels fluctuated but stayed within normal limits. Importantly, the patient's blood pressure improved from 160/100 mmHg (Stage 2 hypertension) to 140/90 mmHg (Stage 1 hypertension). Overall, a 70% symptomatic relief was reported, with no serious adverse events recorded during the *cinnamon* tea intervention. The detail test report before and after treatment are mentioned below in fig 1 & Fig 2.

## 4. DISCUSSION

The findings of this case study suggest that *cinnamon* tea may have beneficial effects in managing hypercholesterolemia and hypertension.<sup>[6]</sup> The significant reduction in triglyceride and VLDL cholesterol levels aligns with previous research demonstrating the lipid-lowering properties of *cinnamon* and its bioactive compounds like cinnamaldehyde.<sup>[7]</sup> Several mechanisms have been proposed to explain *cinnamon*'s cholesterol-lowering effects, including inhibition of cholesterol biosynthesis, increased cholesterol excretion, and enhancement of LDL receptor activity.<sup>[8]</sup> The polyphenolic antioxidants present in *cinnamon* may also contribute to its cardioprotective effects by reducing oxidative stress and inflammation.<sup>[9]</sup> While total cholesterol levels increased slightly post-intervention, they remained within the desirable range, potentially due to the interplay of various cholesterol fractions.<sup>[10]</sup> The observed fluctuations in HDL and LDL cholesterol levels may be attributed to individual variability or require longer intervention periods to stabilize. The improvement in blood pressure, from Stage 2 hypertension to Stage 1 hypertension, is important. *Cinnamon* has been reported to possess vasodilatory and antioxidant

properties, which may contribute to its blood pressure-lowering effects. However, the patient's blood pressure remained above normal levels, suggesting that *cinnamon* tea alone may not be sufficient for managing hypertension in some cases. It is important to note that this is a single-case study, and the results should be interpreted with caution. Individual variations in response to treatment, dietary factors, and potential confounding variables may influence the observed outcomes. In addition, the study duration of 2 months may not be sufficient to assess the long-term effects of *cinnamon* tea consumption on cholesterol levels and blood pressure. Larger clinical trials with longer follow-up periods and standardized *cinnamon* preparations are warranted to confirm the efficacy and safety of *cinnamon* as a complementary therapy for hypercholesterolemia and hypertension.

## 5. CONCLUSION

The findings of this case study suggest that *cinnamon* tea may have beneficial effects in managing hypercholesterolemia and hypertension, although larger clinical trials are needed to confirm its efficacy and safety.

## 6. ACKNOWLEDGMENT

Nil.

## 7. AUTHORS' CONTRIBUTIONS

All the authors contributed equally to design and execution of the article.

## 8. FUNDING

Nil.

## 9. ETHICAL APPROVALS

This study is not required ethical clearance as it is a case study.

## 10. CONFLICTS OF INTEREST

Nil.

## 11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

## 12. PUBLISHERS NOTE

This journal remains neutral with regard to jurisdictional claims in published institutional affiliation.

## REFERENCES

1. Bianconi V, Banach M, Pirro M, International Lipid Expert Panel (ILEP). Why patients with familial hypercholesterolemia are at high cardiovascular risk? Beyond LDL-C levels. *Trends Cardiovasc Med* 2021;31:205-15.
2. Balwan WK, Kour S. Lifestyle diseases: The link between modern lifestyle and threat to public health. *Saudi J Med Pharm Sci* 2021;7:179-84.
3. Crismaru I, Pantea Stoian A, Bratu OG, Gaman MA, Stanescu AM, Bacalbasa N, *et al.* Low-density lipoprotein cholesterol lowering treatment: The current approach. *Lipids Health Dis* 2020;19:85.

4. Thiyagarajan S, John S. Comparative study on the efficacy of *Cinnamomum zeylanicum* capsule and infusion on serum cholesterol level of subjects with type 2 diabetes. *Himal J Health Sci* 2020;5:32-6.
5. Gruenwald J, Freder J, Armbruester N. Cinnamon and health. *Crit Rev Food Sci Nutr* 2010;50:822-34.
6. Bandara T, Uluwaduge I, Jansz ER. Bioactivity of cinnamon with special emphasis on diabetes mellitus: A review. *Int J Food Sci Nutr* 2012;63:380-6.
7. Haldar S, Tanwar A, Singh A, Mehra G, Sain M, Kumar V. Bioactive compounds in cinnamon. In: *Spice Bioactive Compounds*. Boca Raton: CRC Press; 2022. p. 45-70.
8. Charles DJ. Cinnamon. In: *Antioxidant Properties of Spices, Herbs and Other Sources*. Berlin: Springer Science; 2013. p. 231-43.
9. Abeysekera WP, Premakumara GA, Ratnasooriya WD, Abeysekera WK. Anti-inflammatory, cytotoxicity and antilipidemic properties: Novel bioactivities of true cinnamon (*Cinnamomum zeylanicum* Blume) leaf. *BMC Complement Med Ther* 2022;| 22:259.
10. Hadi A, Campbell MS, Hassani B, Pourmasoumi M, Salehi-Sahlabadi A, Hosseini SA. The effect of cinnamon supplementation on blood pressure in adults: A systematic review and meta-analysis of randomized controlled trials. *Clin Nutr ESPEN* 2020;36:10-6.

**How to cite this article:**

Nawaz SM, Murugesan S, Devi KG, Mariappan S, Kuppusamy MK. Potential Cholesterol-lowering and Antihypertensive Effects of *Cinnamon* Tea: A Single Case Study IRJAY. [online] 2024;7(5);13-16.

**Available from:** <https://irjay.com>

**DOI link-** <https://doi.org/10.48165/IRJAY.2024.70503>

TESTS RESULTS



LIFESPAN DIAGNOSTICS  
Mail ID : lifespanhome@gmail.com

7418920066  
8667307618

| Patient Information                    |  | Specimen Information            |  |
|--|--|---------------------------------|--|
| Pat. ID : LSD-563                      |  |                                 |  |
| Name : Mr.SARDAR                       |  | Sample ID : 621                 |  |
| Age : 52 Yrs Sex : Male                |  | Collected On : 11-10-2023 12:48 |  |
| Ref.By : Dr.S.MOHAMMED NAWAZ B.N.Y.S., |  | Reported On : 11-10-2023 22:17  |  |

FINAL TEST REPORT Page 1 of 2

| TEST NAME / METHOD                         | RESULT | UNITS      | NORMAL RANGES  |
|--|--------|------------|--|
| <b>HAEMATOLOGY</b>                         |        |            |  |
| <b>COMPLETE BLOOD COUNT</b>                |        |            |  |
| Total WBC Count                            | 5400   | /µL        | 4000.0 - 11000.0   |
| Haemoglobin                                | 14.2   | gm/dl      | 12.0 - 16.0  |
| Red Blood Cell Count                       | 5.36   | mil/µL     | 4.0 - 6.5  |
| Packed Cell Volume                         | 42.3   | %          | 34-55  |
| Mean Corpuscular Volume                    | 81.4   | fL         | 78.0 - 98.0  |
| Mean Corpuscular Haemoglobin               | 29.4   | Pg         | 27.0 - 32.0  |
| Mean Corpuscular Haemoglobin Concentration | 34.5   | g/dl       | 31.0 - 36.0  |
| Platelet Count                             | 2.41   | Lakhs/cumm | 1.5 - 4.5  |
| <b>Differential Counts</b>                 |        |            |  |
| Neutrophils                                | 58.7   | %          | 40.0 - 70.0  |
| Lymphocyte                                 | 32.3   | %          | 20.0 - 45.0  |
| Eosinophils                                | 04     | %          | 1.0 - 7.0  |
| Monocytes                                  | 4.0    | %          | 2.0 - 7.0  |
| Basophils                                  | 01     | %          | 0.0 - 1.0  |
| PCT  | 0.25   | %          | 0.19 - 0.39  |
| MPV  | 9.4    | fL         | 6.5 - 12.0   |
| PDW  | 11.3   | fL         | 10 - 15  |
| PLCR                                       | 28.4   | %          | 19.7 - 42.4  |
| <b>BIOCHEMISTRY</b>                        |        |            |  |
| <b>Lipid Profile</b>                       |        |            |  |
| Cholesterol Total (Method : CHOD-PAP)      | 162.4  | mg/dL      | <200 : Desirable<br>200 - 239: Borderline High<br>>240: High |
| Triglycerides (Method : GPO-TOPS)          | 232.6  | mg/dL      | <150 : Normal<br>150-199 : Borderline High<br>> 200 : High   |

SHIFA CLINIC ROYAL FUNCTION HALL COMPLEX, BAZAR STREET, PERNAMBUT - 635810

*Dr. Sivanandh*



LIFESPAN DIAGNOSTICS  
Mail ID : lifespanhome@gmail.com

7418920066  
8667307618

| Patient Information                    |  | Specimen Information            |  |
|--|--|---------------------------------|--|
| Pat. ID : LSD-563                      |  |                                 |  |
| Name : Mr.SARDAR                       |  | Sample ID : 621                 |  |
| Age : 52 Yrs Sex : Male                |  | Collected On : 11-10-2023 12:48 |  |
| Ref.By : Dr.S.MOHAMMED NAWAZ B.N.Y.S., |  | Reported On : 11-10-2023 20:17  |  |

FINAL TEST REPORT Page 2 of 2

| TEST NAME / METHOD                                     | RESULT | UNITS  | NORMAL RANGES   |
|--|--------|--------|---|
| HDL Cholesterol (Method : Selective Inhibition Method) | 68.9   | mg/dL  | Males : 35 - 80<br>Females : 42 - 88  |
| LDL Cholesterol (Method : Calculated)                  | 47     | mg/dL  | 0 - 150   |
| VLDL Cholesterol (Method : Calculated)                 | 47     | mg/dl  | 80 - 130  |
| Cholesterol / HDL (Method : Calculated)                | 2.4    | Ratio  | 3.5 - 5.5   |
| LDL/HDL (Method : Calculated)                          | 0.7    | Ratio  | 1.5 - 3.5   |
| Triglycerides / HDL (Method : Calculated)              | 3.38   | Ratio  | <3.12   |
| Non - HDL Cholesterol (Method : Calculated)            | 93.5   | mg /dl | <160.0  |
| Random Blood Sugar (Method : GOD POD METHOD)           | 138.0  | mg/dl  | 60-160  |
| Blood Urea (Method : Urease UV)                        | 22.2   | mg/dL  | 10.0 - 50.0   |
| Creatinine (Method : Jaffe with out Deproteinization)  | 0.9    | mg/dL  | Male : 0.6 - 1.2<br>Female : 0.6 - 1.3<br>Child New born(1-4 days) : 0.3 - 1<br>Infant : 0.2 - 0.4<br>Child : 0.3 - 0.7<br>Adolescent : 0.5 - 1.0 |
| Uric Acid  | 5.0    | mg/dL  | Female : 3.5 - 6.0<br>Male : 3.5 - 7.0  |

Please Correlate with Clinical Conditions

End of the Report

*Dr. Sivanandh*  
RAZIULLAH R DMLT  
ADMIN

*Dr. Sivanandh*  
ARSHAD HUSSAIN N DMLT  
LAB TECHNOLOGIST

SHIFA CLINIC ROYAL FUNCTION HALL COMPLEX, BAZAR STREET, PERNAMBUT - 635810

*Dr. Sivanandh*



LIFESPAN DIAGNOSTICS  
Mail ID : lifespanhome@gmail.com

7418920066  
8667307618

| Patient Information                    |  | Specimen Information            |  |
|--|--|---------------------------------|--|
| Pat. ID : LSD-1898                     |  |                                 |  |
| Name : Mr.SARDAR.D                     |  | Sample ID : 814                 |  |
| Age : 53 Yrs Sex : Male                |  | Collected On : 03-12-2023 15:26 |  |
| Ref.By : Dr.S.MOHAMMED NAWAZ B.N.Y.S., |  | Reported On : 03-12-2023 23:15  |  |

FINAL TEST REPORT Page 1 of 2

| TEST NAME / METHOD                                  | RESULT | UNITS      | NORMAL RANGES    |
|---|--------|------------|------------------|
| <b>HAEMATOLOGY</b>                                  |        |            |                  |
| <b>COMPLETE BLOOD COUNT</b>                         |        |            |                  |
| Total WBC Count                                     | 5200   | /µL        | 4000.0 - 11000.0 |
| Haemoglobin   | 14.1   | gm/dl      | 12.0 - 16.0      |
| Red Blood Cell Count                                | 5.28   | mil/µL     | 4.0 - 6.5        |
| Packed Cell Volume                                  | 39.5   | %          | 34-55            |
| Mean Corpuscular Volume                             | 79.2   | fL         | 78.0 - 98.0      |
| Mean Corpuscular Haemoglobin                        | 31.2   | Pg         | 27.0 - 32.0      |
| Mean Corpuscular Haemoglobin Concentration          | 35.1   | g/dl       | 31.0 - 36.0      |
| Platelet Count                                      | 2.91   | Lakhs/cumm | 1.5 - 4.5        |
| <b>Differential Counts</b>                          |        |            |                  |
| Neutrophils   | 59.4   | %          | 40.0 - 70.0      |
| Lymphocyte  | 31.6   | %          | 20.0 - 45.0      |
| Eosinophils   | 04     | %          | 1.0 - 7.0        |
| Monocytes   | 4.0    | %          | 2.0 - 7.0        |
| Basophils   | 01     | %          | 0.0 - 1.0        |
| PCT   | 0.29   | %          | 0.19 - 0.39      |
| MPV   | 9.6    | fL         | 6.5 - 12.0       |
| PDW   | 14.1   | fL         | 10 - 15          |
| PLCR  | 29.4   | %          | 19.7 - 42.4      |
| RDW - CV  | 13.1   | %          | 11.6 - 14        |
| RDW - SD  | 45.9   | fL         | 39 - 46          |
| <b>BIOCHEMISTRY</b>                                 |        |            |                  |
| <b>Random Blood Sugar (Method : GOD POD METHOD)</b> |        |            |                  |
|   | 175.0  | mg /dl     | 60-160           |
| <b>Lipid Profile</b>                                |        |            |                  |

SHIFA CLINIC ROYAL FUNCTION HALL COMPLEX, BAZAR STREET, PERNAMBUT - 635810

*Dr. Sivanandh*



LIFESPAN DIAGNOSTICS  
Mail ID : lifespanhome@gmail.com

7418920066  
8667307618

| Patient Information                    |  | Specimen Information            |  |
|--|--|---------------------------------|--|
| Pat. ID : LSD-1898                     |  |                                 |  |
| Name : Mr.SARDAR.D                     |  | Sample ID : 814                 |  |
| Age : 53 Yrs Sex : Male                |  | Collected On : 03-12-2023 15:26 |  |
| Ref.By : Dr.S.MOHAMMED NAWAZ B.N.Y.S., |  | Reported On : 03-12-2023 23:15  |  |

FINAL TEST REPORT Page 2 of 2

| TEST NAME / METHOD                                     | RESULT | UNITS  | NORMAL RANGES  |
|--|--------|--------|--|
| Cholesterol Total (Method : CHOD-PAP)                  | 172.5  | mg/dL  | <200 : Desirable<br>200 - 239: Borderline High<br>>240: High |
| Triglycerides (Method : GPO-TOPS)                      | 176.4  | mg/dL  | <150 : Normal<br>150-199 : Borderline High<br>> 200 : High   |
| HDL Cholesterol (Method : Selective Inhibition Method) | 54.1   | mg/dL  | Males : 35 - 80<br>Females : 42 - 88                         |
| LDL Cholesterol (Method : Calculated)                  | 83     | mg/dL  | 0 - 150  |
| VLDL Cholesterol (Method : Calculated)                 | 35     | mg /dl | 80 - 130   |
| Cholesterol / HDL (Method : Calculated)                | 3.2    | Ratio  | 3.5 - 5.5  |
| LDL/HDL (Method : Calculated)                          | 1.5    | Ratio  | 1.5 - 3.5  |
| Triglycerides / HDL (Method : Calculated)              | 3.26   | Ratio  | <3.12  |
| Non - HDL Cholesterol (Method : Calculated)            | 118.4  | mg /dl | <160.0   |

Please Correlate with Clinical Conditions

End of the Report

*Dr. Sivanandh*  
RAZIULLAH R DMLT  
ADMIN

*Dr. Sivanandh*  
ARSHAD HUSSAIN N DMLT  
LAB TECHNOLOGIST

SHIFA CLINIC ROYAL FUNCTION HALL COMPLEX, BAZAR STREET, PERNAMBUT - 635810

*Dr. Sivanandh*