

# Effect of Supplementation of Mango Ginger (*Curcuma Amada Roxb*) on Mild Hypercholesterolemic Adults

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**Abstract-** *Mango ginger (Curcuma amada Roxb.) is a perennial, rhizomatous, aromatic herb belonging to the family Zingiberaceae. The spice abundantly used in Ayurveda and Unani system of medicine and also for culinary purpose. They are used as an appetizer, astringent, laxative, stomachic, antipyretic, carminative, aphrodisiac, diuretic, emollient and expectorant. The mango ginger has been used in clinical trials where it has been reported to reduce serum cholesterol in hypercholesterolemic rats. Hence the present study carried out with the objective of find out the hypocholesterolemic effect of Mango ginger (Curcuma amada Roxb.) on mild hypercholesterolemic adults.*

**Keywords-** Adults, appetizer, hypercholesterolemia, mango ginger

## I. INTRODUCTION

Cardiovascular diseases are one of the main causes of death or life-threatening morbidities throughout the world. The contributing factors for the growing burden of CVDs are increasing prevalence of cardiovascular risk factors especially hypertension, Hypercholesterolemia, diabetes, overweight or obesity, physical inactivity and tobacco use. Cardiovascular disease (CVD) is the leading cause of death worldwide, and mortality due to CVD is higher in low- and middle-income countries<sup>1</sup>. Changes in lifestyle and dietary pattern, lack of physical activity and inadequate relief of stress are key contributors in the development and progression of hypercholesterolemia. It can be treated by reducing dietary cholesterol intake, administration of certain medications, and rarely with other treatments including surgery and supplementation of cholesterol lowering foods. Nowadays, herbs are considered to be the main source of effective drugs for lowering serum cholesterol and sugar level. There are more than 80 spices grown in different parts of the world and around 50 of them are grown in India and when it comes to necessity of culinary herbs in human life, spices play a major role as they are versatile in feature<sup>2</sup>. Mango ginger (*Curcuma amada Roxb.*) spice abundantly used in *Ayurveda* and *Unani* system of medicine and also for culinary purpose. Clinical trials of mango ginger reported that to reduce serum cholesterol in hypercholesterolemic rats. Hence the present

study carried out with the objective of find out the hypocholesterolemic effect of Mango ginger (*Curcuma amada Roxb.*) on mild hypercholesterolemic adults.

## II. MATERIALS AND METHODS

The area selected for the study was Kottayam district Kerala. A total of 500 adult subjects irrespective of sex were collected from household visits and from Kudumbashree units of Kottayam District Panchayat. Interview method was adopted to collect data from selected subject using an interview schedule regarding background information, anthropometric measurements, lifestyle habits, diet history and medical history. All the subjects were screened for total cholesterol. Forty mild hypercholesterolemic adult women were selected for supplementation study. Twenty subjects were supplemented with mango ginger (*Curcuma amada Roxb*) for a period of 90 days and referred as experimental group. Other group of twenty subjects referred as control group did not get any treatment. The lipid profile of the selected subjects was estimated before and after supplementation and statistically analyzed to draw conclusions.

## III. RESULTS AND DISCUSSIONS

### A. Socio economic profile of the selected subjects

The background information of the subjects pertaining to their gender, family income, education level and type of occupation is discussed in Table I.

**Table I Socio economic profile of the subjects  
N=500**

Particulars	Number
<b>Gender</b>	
Male	105
Female	395
<b>Monthly income*</b>	
Economically weaker section (Rs. ≤3300)	16
Low income group (Rs.3301-7300)	284
Middle income group Rs.7301-14500)	185
<b>Education level</b>	
High income group (Rs.>14500)	15
High School	393
Under Graduate	79
Post Graduate	28

\*HUDCO (2007)

As the subjects were purposively selected from women’s association programme like ‘Kudumbashree’ in Kottayam, majority (79%) of the selected subjects were females and 21 per cent were males.

According to HUDCO<sup>3</sup> family monthly classification 57 per cent were belonged to low income group followed by 37 per cent were belonged to middle income group. The cholesterol level of low income group and middle income group are found to be little higher than that of high income group.

It was surprised to see that all the subjects were educated. Seventy eight per cent were completed primary level education up to high school. According to Kerala State Literacy Mission Authority (KSLM) Kottayam had attained the position of the first town with total literacy in the state in 18<sup>th</sup> June 1989.

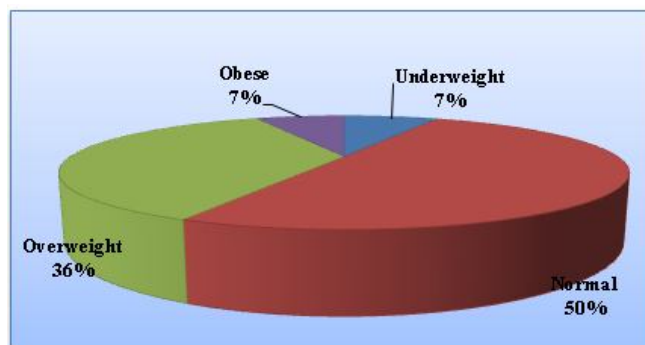
Majority 40 per cent were unemployed. As majority of the subjects were females they were not interested to be an employee and give importance to take care of their family.

**B. Anthropometric data of the selected subjects**

The height, weight, waist circumference and hip circumference of the selected subjects were measured and from these values Ideal Body Weight, Body Mass Index and Waist Hip Ratio were calculated.

**a) Body Mass Index (BMI)**

Figure 1 depicted the percentage distribution of selected subjects according to Body Mass Index (BMI)<sup>4</sup>



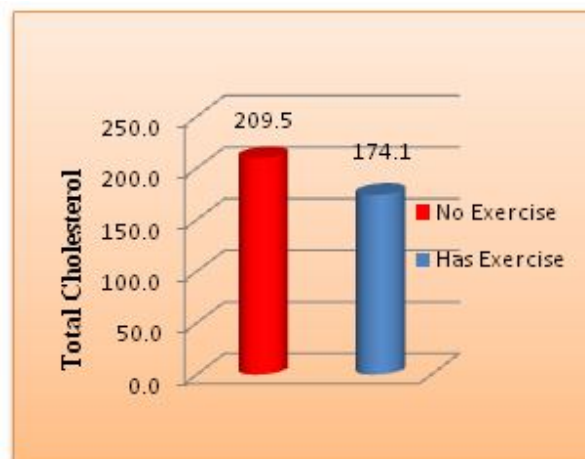
**Figure 1 BMI level of the selected subjects**

**b) Waist Hip Ratio (WHR)**

According to WHO<sup>5</sup> only minority (10%) of men subjects were at risk of abdominal obesity. Thirty four per cent were in the border line. Among females 39 per cent of the female subjects were in risk of abdominal obesity and 49 per cent were in boarder line.

**C. Lifestyle Habits of the Selected Subjects**

Exercise pattern of the selected subjects were observed and found that majority (79%) of the subjects didn’t do any kind of exercise. Exercise pattern and total cholesterol levels of selected subjects presented in Figure 2.



**Figure 2 Exercise pattern and total cholesterol level of selected subjects**

The modern consumption pattern and reduction in physical activities are the reason for increasing lifestyle diseases in Kerala<sup>6</sup>.

**D. Dietary habits of the selected subjects**

Ninety one per cent of the subjects are non-vegetarians. They were taking non-vegetarian food mainly fish on daily basis.

Majority prefer to consume egg as whole without removing the egg yolk. Fifty per cent of the selected subjects prefer deep fried snack items in the tea time.

**E. Biochemical parameters of the selected subjects**

All the subjects were screened for total cholesterol and the results were presented in the Table II.

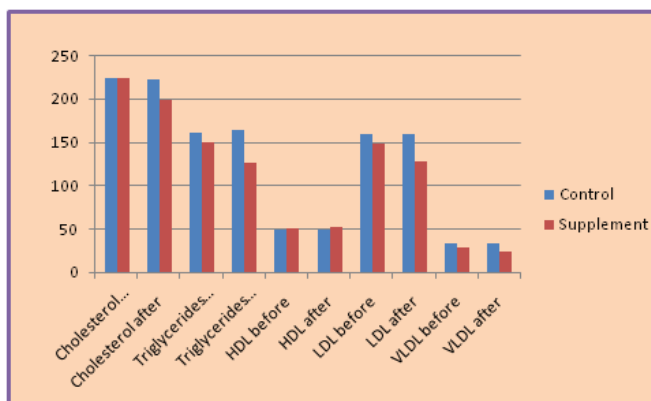
**Table II Percentage distribution of Selected Subjects according to Total Cholesterol**  
N=500

Total Cholesterol Category*	Number	Per cent
Desirable (<200 mg/dl)	261	52
Borderline (200-239 mg/dl)	108	22
High (≥240 mg/dl)	131	26

\*WHO,2009<sup>7</sup>

**F. IMPACT OF SUPPLEMENTATION**

The lipid profile level of the experimental group had decreased and HDL level gets improved after supplementation of Mango ginger for a period of 90 days. The decrease was statistically significant at five percent level (Figure 3)



**Figure 3 Lipid profile of the selected subjects before and after supplementation**

**IV. CONCLUSION**

Mango ginger (*Curcuma amada* Roxb) has a positive effect on lipid profile of mild hypercholesterolemic adults that decreases total cholesterol, triglycerides, LDL and VLDL parameters in blood.

**V. ACKNOWLEDGEMENT**

University Grants Commission (UGC), New Delhi

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