ORIGINAL ARTICLE

Physiological and Biochemical Role of Curcuma Longa in Hyperlipidemic Individuals, a comparative study

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ABSTRACT

In this study we investigated the unique property of turmeric or Curcuma longa as a lipids lowering agent. In this study cholesterol, triglyceride, high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) were measured of 150 individuals. The turmeric extract (1 g twice a day) as therapeutic dose was given to the hyperlipidemic individuals for 8 weeks. Their lipid profile was measured after 4 and 8 weeks respectively. A significant (< 0.05) change in their serum cholesterol, HDL, LDL and triglyceride levels (150.12±45.11, 21.33±10.2, 135.52±43.41, 120.69±25.4) were seen as compared with the non-treated individuals (273.27±52.81, 14.83±12.2, 225.12±23.41, 174.49±15.4) comparatively.The present study showed that turmeric or Curcuma longaextracthighlysignificantindecreasing all the lipid fractions except HDL which was decreased non-significantly.

Keyword:turmeric or Curcuma longa, Low and High Density Lipoprotein Cholesterol, Triglyceride

INTRODUCTION

Cardiovascular diseases are the major cause of mortality and morbidity both in the developed and developing countries (Aqil et al 2008). Hyperlipidemia is a major risk factor of cardiovascular disease (CVD) in all over the World. There are number of clinical & epidemiological studies stated thathyperlipidemiahas vast role in pathogenesis of atherosclerosis (*Jaffar et al 2004)*. Especially hyper-cholesterolemiais an indicated factorfor CVD for a long time.Many studies have found positive correlation between atherosclerosis and high levels of serum low density lipoprotein (LDL) and negative correlation with high density lipoprotein (HDL) (Dahri et al 2005). In the same way high levels of serum triglycerides are also considered as a major risk factor in the CVD.

Curcuma longa or turmeric is an herbal plant belonging to the botanical family of zingiberaceae (atishkumar 2005). Turmeric is a perennial herbaceous plant and its height may be up to 1 m. Phenotypically it is highly branched and has alternate and arranged in two rows leaves. Its phytochemical composition describes that it contains alkaloids, fixed and volatile oils and variety of pharmacologically active substances(Vaughn et al., 2016).Curcuma longa or turmeric is a medicinal herb which has many health remedies againstmuch disease like asthma, hypertension, diabetes, hyperlipidemia, inflammation, arthritis, tumours, gastrointestinal disturbances and gynaecological disorders for over 2000 years (Ratul Kumaret al 2010)

In turmeric the main active ingredient is Curcumin. Curcumin is an organic yellow pigment associated with the curry spice. It has anti-inflammatory properties and performs very important protective functions against life threatening disease. Curcuminhas the reducing property of lipid and plaque levels in arteries (Remadevi et al 2005).

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MATERIAL AND METHOD

The current clinical study was conducted in Jinnah hospital Lahore. In this study total 150 individuals were selected and they were divided into two groups. In Group B, 100 individuals were pathologically hyperlipidemic. While in Group A, 50 individuals were normal .The oral therapeutic dosage (1g.twice a day) of Turmeric was given to the individuals of Group B. whereas Group A is control. The lipid profile including cholesterol, triglyceride and HDL was determined by standard protocols given in diagnostic kits by Human, Germany. The results were expressed as the means ±SD of groups. The means values were analysed by one way (ANOVA) while all parameters were analysed by SPSS.

RESULTS

According to the Table.1, serum cholesterol, HDL, LDL and triglyceride levels of normal individuals of Group Awere (73.97±3.8, 24.93±2.2, 35.12±2.1, 74.39±5.4) while of hyperlipidemic individuals of Group B were (273.27±52.81, 14.83±12.2, 225.12±23.41, 174.49±15.4)respectively. When (1g,B.D) therapeutic dose of turmeric was give to

them theserum cholesterol, HDL, LDL and triglyceride levels after 4 weeks were (200.37±32.81, 19.73±22.12, 190.32±27.41, 150.29±25.2) and after 8 weeks were(150.12±45.11, 21.33±10.2, 135.52±43.41, 120.69±25.4) represented in Table2 and Table 3 respectively. Comparatively significant changes have seen in turmeric treated individuals.

Table 1:Lipid profile of individuals without any treatment (n=150)

Study Group	TC (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	TG(mg/dl)
	Mean values ± SD	Mean values ± SD	Mean values ± SD	Mean values ± SD
A	73.97±3.8	24.93±2.2	35.12±2.1	74.39±5.4
B	273.27±52.81	14.83±12.2	225.12±23.41	174.49±15.4

< 0.05

Table 2: Lipid profile ofTurmericTreated individualsafter 4 weeks (n=150)

Study Group	TC (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	TG(mg/dl)
	Mean values ± SD	Mean values ± SD	Mean values ± SD	Mean values ± SD
A	73.97±3.8	24.93±2.2	35.12±2.1	74.39±5.4
B	200.37±32.81	19.73±22.12	190.32±27.41	150.29±25.2

< 0.05

Table 3: Lipid profile of Turmeric Treated individuals after 8 weeks (n=150)

Study Group	TC (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	TG(mg/dl)
	Mean values ± SD	Mean values ± SD	Mean values ± SD	Mean values ± SD
A	73.97±3.8	24.93±2.2	35.12±2.1	74.39±5.4
B	150.12±45.11	21.33±10.2	135.52±43.41	120.69±25.4

< 0.05

DISCUSSION

In this study we investigated the unique property of turmeric or Curcuma longa as a lipids lowering agent.For this purpose cholesterol, triglyceride, high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) were measured of 150 individuals. The turmeric extract treatment (1 g twice a day) was given to the hyperlipidemic individuals for 8 weeks. Their lipid profile was measured after 4 and 8 weeks respectively. A significant (< 0.05) change in their serum cholesterol, HDL, LDL and triglyceride levels (150.12±45.11, 21.33±10.2, 135.52±43.41, 120.69±25.4) have seen as compared with the non-treated individuals (273.27±52.81, 14.83±12.2, 225.12±23.41,174.49±15.4) comparatively.

RatulKumaret al., described in his study that turmeric exerts has cardio-protective effects mainly by antioxidant activity, lowering lipid peroxidation, antidiabetic activity and inhibiting platelet aggregation. A study by Negi et al., 1999stated that 1g twice a day turmeric extract showed significant decrease in serum cholesterol and triglyceride levels. Same results was concluded by (*Nagpal and Sood ,2013*) in his study.

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