

EFFECT OF ASCORBIC ACID ON TOTAL AND HIGH DENSITY LIPOPROTEIN CHOLESTEROL OF PLASMA IN NORMAL HUMAN SUBJECTS

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Summary : Ascorbic acid, 30 mg/kg/day, fed for 20 days did not significantly change either total cholesterol or high density lipoprotein cholesterol of plasma of 27 male medical college students of ages varying between 17 and 20 years.

Key words : ascorbic acid total cholesterol lipoprotein-cholesterol

INTRODUCTION

High total cholesterol and low high density lipo-protein cholesterol (HDL cholesterol) are major factors predisposing atherosclerosis (1, 3, 4, 6, 7, 8, 10). Ascorbic acid potentiates hypocholesteremic effect of clofibrate and lowers cholesterol level in scorbutic guinea pigs (9). The effect of administration of ascorbic acid in large doses on plasma total cholesterol and HDL cholesterol was, therefore, studied.

MATERIALS AND METHODS

Twentyseven healthy male medical students aged between 17 and 20 years were selected. Plasma cholesterol and high density lipoprotein cholesterol were determined before and after feeding ascorbic acid 30 mg/kg/day, for 20 days. Cholesterol was determined by method described by Kim (5). HDL cholesterol was separated by Burstein's method (2). Misra *et al.* (8) estimated cholesterol and HDL cholesterol in serum and plasma and found that there was no quantitative difference. Hence in this study plasma was used for determination of cholesterol and HDL cholesterol. Fasting blood samples were collected in EDTA Bulbs (1 mg EDTA/ml of blood) and plasma was separated by centrifugation.

RESULTS

Results show that ascorbic acid given in large dose to normal persons does not alter total cholesterol, HDL cholesterol or the ratio of HDL cholesterol to total cholesterol (Table I).

(Weights of the individuals under study did not change during the period of study).

TABLE I: Plasma cholesterol and HDL cholesterol before and after feeding ascorbic acid, 30 mg/kg/day, for 20 days. n=27

Parameter	Before ascorbic acid Mean \pm S.D.	After feeding ascorbic acid Mean \pm S.D.	t value	Significance
Plasma total cholesterol mg %	163 \pm 27	186 \pm 32	0.2139	Not significant (P > 0.05)
HDL cholesterol mg%	68 \pm 35	66 \pm 19	0.00867	Not significant P > 0.05

DISCUSSION

High total cholesterol level has been linked with atherosclerosis for a long time. However, it has been now reported that low HDL cholesterol and low HDL/total cholesterol ratio is more important predisposing factor than total cholesterol for atherosclerosis, and therefore is considered a major risk factor in producing thrombotic disorders. (3, 4, 6, 7, 7, 8, 10). Ascorbic acid was shown to lower cholesterol in scorbutic guinea pigs. Such studies are not reported in human beings. This study however, indicates that ascorbic acid, *per se* has no effect on total cholesterol and HDL cholesterol in normal young persons.

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DISCUSSION

High total cholesterol level has been linked with atherosclerosis for a long time. However, it has been reported that low HDL cholesterol and low HDL cholesterol to total cholesterol ratio are more important risk factors than total cholesterol for atherosclerosis. Vit. C is considered a major risk factor in producing thrombotic disorders (1, 2, 3, 4, 5, 6, 7, 8, 9, 10). Ascorbic acid was shown to lower cholesterol in atherosclerotic guinea pig. Such studies are not reported in human beings. The study however indicates that ascorbic acid may have an effect on total cholesterol and HDL cholesterol in adult young patients.

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