

A STUDY ON THE STATUS
OF
ANTIOXIDANTS IN
CARDIOVASCULAR DISEASES



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ABSTRACT

The oxidative modification of LDL-cholesterol in human serum or plasma is considered to be important in the pathogenesis of cardiovascular diseases and antioxidants are known to protect LDL-cholesterol from oxidation. Hence, a study was undertaken to assess the antioxidant status in subjects with cardiovascular diseases (diagnosed).

Concentration of plasma or serum and blood antioxidants, such as ascorbic acid(vitamin C), α -tocopherol (vitamin E), β -carotene, glutathione, caeruloplasmin; total cholesterol, HDL-cholesterol, LDL-cholesterol, triglyceride and total-cholesterol to HDL-cholesterol ratio of 76 study subjects were compared with 46 control subjects matched for age and sex.

Significant differences were observed in systolic blood pressure(SBP) (142.38 ± 15.80 mm Hg in CVD subjects and 122.70 ± 13.01 mm Hg in controls, $p=0.0001$), diastolic blood pressure (DBP) (92.40 ± 12.40 mm Hg in CVD subjects and 81.60 ± 6.90 mm Hg in controls, $p=0.0001$) and total cholesterol (231.50 ± 34.0 mg/dL in CVD subjects and 219.30 ± 31.60 mg/dL in controls, $p=0.05$), HDL-cholesterol (44.30 ± 12.40 mg/dL in CVD subjects and 52.60 ± 14.10 mg/dL in controls, $p=0.0009$), triglyceride (149.10 ± 84.90 mg/dL in CVD subjects and 97.20 ± 37.80 mg/dL in controls, $p=0.0001$) and total cholesterol to HDL-cholesterol ratio (5.60 ± 1.72 in CVD subjects and 4.4 ± 1.0 in controls, $p=0.0001$). The HDL-cholesterol was significantly higher in controls than that of study subjects; the other parameters being significantly higher in CVD subjects with the exception of LDL-cholesterol.

Among all the antioxidants vitamin E concentration was significantly ($p=0.023$) lower in CVD subjects (4.90 ± 3.5 mg/L) compared to the controls (7.30 ± 4.0 mg/L). Others, caeruloplasmin and glutathione concentrations were higher in CVD subjects than controls, but the differences were statistically not significant. Vitamin C and β -carotene concentrations were higher in controls than that of CVD subjects and the differences were statistically not significant.

Comparison of hypertensive, ischaemic heart disease and control subjects revealed that the vitamin C concentration was significantly lower in ischaemic heart disease subjects than control subjects (Fisher PLSD test, $p<0.05$) and vitamin E concentration was significantly lower in hypertensives than control subjects (Fisher PLSD test, $p<0.05$).

Simple regression analysis indicated an inverse association between systolic blood pressure and all antioxidants studied, such as vitamin C, vitamin E, glutathione and caeruloplasmin and, between diastolic blood pressure and antioxidants, such as vitamin E and glutathione in control subjects.

In CVD subjects an **inverse** association was observed between LDL-cholesterol concentration and vitamin C and glutathione.

Regression analysis between triglyceride and all antioxidants in CVD subjects and, between triglyceride and vitamin C, β -carotene and caeruloplasmin in control subjects revealed inverse association.

Thus, the concentration of cardiovascular disease risk factors, such as total cholesterol, LDL-cholesterol and triglyceride were higher in CVD subjects in whom the concentrations of antioxidants, such as vitamin E, vitamin C and β -carotene were found to be lower.

CONTENTS

	<u>Page</u>
Title	i
Declaration	ii
Dedication	iii
Affirmation	iv
Approval	v
Abstract	vi
Acknowledgement	viii
Contents	ix
Chapter 1	01
1.0 General Introduction	02
1.1 Introduction	02
1.1.1 Oxidative Stress	07
1.1.2 Antioxidant defense	07
1.1.2.1 Vitamin E	08
1.1.2.2 Vitamin C	11
1.1.2.3 Carotenoids	13
1.1.2.4 Glutathione	16
1.1.2.5 Caeruloplasmin	17
1.2 Review of Literature	19
1.2.1 Serum lipids and healthy volunteers	19
1.2.2 Serum lipids and hypertension	20
1.2.3 Serum lipids and Ischaemic heart disease	21
1.2.4 Serum lipids and Myocardial infarction	22

	<u>Page</u>
1.2.5 Blood pressure and antioxidants	23
1.2.6 Myocardial infarction and vitamin E in LDL fraction; vitamin E and C.	25
1.2.7 Coronary heart disease and antioxidant vitamins E, C and carotene	27
1.2.8 Angina pectoris and antioxidant vitamins A, C, E and carotene.	29
1.2.9 Ischaemic heart disease and vitamins E and A.	30
Chapter 2	32
2.0 Material and Methods	33
2.1 Hypothesis	33
2.1.1 Objectives of the Project	33
2.2 Experimental Design and Sampling	33
2.2.1 Analysis	34
2.2.2 Analysis of Data	44
Chapter 3	45
3.0 Results	46
Chapter 4	76
4.0 Discussion	77
Conclusion	86
References	87
Appendix	
Research Protocol	
Questionnaire	