PRELIMINARY STUDIES ON SERUM LIPIDS, APOLIPOPROTEIN-B AND OXIDATIVE STRESS IN XANTHELASMA

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ABSTRACT

Serum lipid profile, apolipoprotein-B (apo-B), malondialdehyde levels(MDA) and superoxide dismutase (SOD) activity were assessed in 12 cases of xanthelasma with and without coronary artery disease (CAD)/hypertension (HTN) and results are compared with healthy controls. Dyslipidemia was found in 65% cases of xanthelasma as compared to 20% healthy controls. Xanthelasma patients had significantly high malondialdehyde (MDA) levels ($p < 0.01$) and significantly decreased ($p < 0.05$) SOD activity as compared to controls. Among xanthelasma patients, xanthelasma with CAD/ HTN showed higher total cholesterol (236 ± 32.7 vs 188 ± 24.7 mg/dl), low density lipoprotein cholesterol (157 ± 35.5 vs 113 ± 16 mg/dl) and Apo-B (120.5 ± 9.4 vs 114 ± 19.2 mg/dl) levels as compared to xanthelasma without CAD/HTN. Results of our study indicate that xanthelasma patients with increased apo-B, MDA and decreased SOD need cardiovascular monitoring.

KEY WORDS : Xanthelasma, apolipoprotein B, superoxide dismutase, malondialdehyde, coronary artery disease.

INTRODUCTION

Xanthelasma palpebrum (XP) is often considered as cutaneous marker of underlying atherosclerosis. However, previous studies have reported 25-52% xanthelasma patients (XP) with normal lipid profile (1). It has also been observed that normocholesterolemic xanthelasma patients carry the risk of coronary artery disease (CAD) much more compared to normocholesterolemic patients (2) without XP. Coupled with this fact, it is also known that subjects with high apo-B levels have increased risk of CAD (3) and CAD is associated with disturbed oxidant/antioxidant balance (4). It was therefore decided to study the

apolipoprotein-B (apo-B), superoxide dismutase (SOD) and malondialdehyde (MDA) activity in xanthelasma patients with or without CAD and/or hypertension (HTN) and age-sex matched healthy controls.

MATERIALS AND METHODS

Present study comprises of 18 subjects. Out of these 12 had xanthelasma and 6 were healthy controls. Among 12 xanthelasma patients, 8 had coronary artery disease (CAD)/hypertension (HTN) (Group A) and 4 were without CAD/HTN (Group B). Patients with acute

myocardial infarction were excluded from this study. The fasting blood samples of all cases were collected for estimation of total cholesterol (TC), high density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C) and very low density lipoprotein cholesterol (VLDL-C), triglycerides, apo-B (5), MDA (6) and SOD (7). In all the groups results were analysed using 'Anova' and 'Turkey' test. The rejection criteria for the null hypothesis was fixed at probability level of 0.05.

Xanthelasma cases associated with and without CAD and or hypertension showed significantly higher levels of serum total cholesterol, very low density lipoprotein cholesterol and apolipoprotein-B levels ($p < 0.01$) when compared to controls. However, low density lipoprotein cholesterol was significantly elevated only in xanthelasma patients associated with CAD/HTN compared to controls. Mean values of high density lipoprotein cholesterol was similar in all the groups (Table 1).

RESULTS AND DISCUSSION

Table 1. Serum lipids and apo-B lipoprotein levels in healthy controls and xanthelasma patients with and without CAD/HTN.

Parameters	Group A (n=8) XP with CAD/ HTN	Group B (n=4) XP without CAD/HTN	Group C (n=6) Healthy controls	Significance
Total serum cholesterol (mg/dl)	236.0 ± 32.7	188.2 ± 24.7	172.0 ± 36.0	p < 0.01
HDL-C (mg/dl)	43.0 ± 8.4	42.2 ± 6.6	43.0 ± 8.2	NS
Serum TG (mg/dl)	169.8 ± 24.1	165.0 ± 67.5	84.6 ± 32.0	p < 0.01
LDL-C (mg/dl)	157.1 ± 35.5	113.0 ± 16.1	112.0 ± 35.6	p < 0.05
VLDL-C (mg/dl)	34.0 ± 4.0	33.2 ± 15.5	16.9 ± 6.4	p < 0.01
Apo-B (mg/dl)	120.5 ± 9.4	114.0 ± 19.2	79.0 ± 9.4	p < 0.001

Values are mean ± S.D. ,

Xanthelasma patients irrespective of cardiac involvement showed significantly increased malondialdehyde ($p < 0.001$) and decreased superoxide dismutase levels ($p < 0.05$) as compared to controls. However, xanthelasma patients with cardiac ailments had significantly decreased SOD activity when compared to xanthelasma without CAD and/or HTN (Table 2).

Thus, increased incidence of dyslipidemia and apo-B levels in xanthelasma patients may either be a reflection of increased risk to CAD and/or HTN or result of the disturbed lipid metabolism associated with xanthelasma. The decreased SOD in CAD/HTN indicates, reduced

antioxidant activity as a result of oxidative stress to which these patients are exposed in the presence of CAD and/or HTN. Oxidative stress leads to increased lipid peroxidation and release of lipid hydroperoxides, aldehydes e.g. malondialdehyde producing further cellular damage (5). Our data indicate that xanthelasma patients with increased apo-B, MDA and reduced SOD merit cardiovascular counseling and life style changes. However, these observations need to be studied further in a larger sample incorporating other biochemical markers like apolipoprotein (a), homocysteine and nitric oxide to find out the exact significance of xanthelasma in CAD/HTN.

Table 2. Malondialdehyde (MDA) levels and activity of erythrocyte SOD in control and xanthelasma patients.

Parameters	Group A (n=8) XP with CAD/ HTN	Group B (n=4) XP without CAD/HTN	Group C (n=6) Healthy controls	Significance
MDA (nmol/ml)	2.45 $\pm$ 0.37	2.35 $\pm$ 0.31	1.89 $\pm$ 0.14	$p < 0.01$
SOD (unit/gmHb)	982.5 $\pm$ 173.9	1000.0 $\pm$ 0.0	1225.0 $\pm$ 160.0	$p < 0.05$

Values are mean $\pm$ S.D.

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