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ANALYSIS OF ANTIOXIDANTS AS A BIOMARKER OF CARDIOVASCULAR RISK IN YOUNG PEOPLE

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Abstract

Introduction: Cardiovascular diseases (CVDs) are a group of diseases that share the principal risk factors and often the aetiology. **Aims and objectives:** The main objective of the study is to analyze the level of antioxidants as a biomarker of cardiovascular risk in young people. **Material and methods:** This cross sectional study was conducted in Shaikh Zayed Hospital, Lahore during October 2018 to January 2109. The data was collected from 100 patients of CVD. The data was collected for the analysis of blood antioxidants level among these patients. Blood sample was drawn for the analysis of serum antioxidants. Blood was centrifuged at 4000 rpm for the separation of serum. Then we find the serum antioxidantslevel by using Ohkawa et al., method. **Results:** The data was collected from 100 CVD patients. The mean age of the study patients was 54.4±10.6 years. Cigarette smoking was much more common in men than in women (32.6% vs. 0, p<0.001). The serum levels of creatinine, uric acid, and cTAS were significantly higher in men than in women (0.9±0.2 vs. 0.7±0.1, 7.6±2.1 vs. 6.8±2.3, and.0.4±0.0 vs. 0.3±0.1, respectively; p<0.001). **Conclusion:** It is concluded that age was not a determinant affecting the antioxidative barrier, regardless of the presence of CHD. We showed through a cross-sectional analysis on a large healthy population that a reduced antioxidant capacity is significantly associated with cardiovascular risk factors.

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INTRODUCTION:

Cardiovascular diseases (CVDs) are a group of diseases that share the principal risk factors and often the aetiology. The main manifestations of CVDs are coronary heart disease and stroke that represents the world's primary cause of death and disability and the most important cause of premature death, in agreement with the World Health Organization [1]. CVDs represent a major health problem worldwide that causes a great public financial effort due to both inability to work and higher pharmaceutical expenditure. Therefore, for their broad and well-recognized importance, strategies to prevent CVDs should be considered as a priority for all citizens and healthcare systems [2].

The main target of primary prevention is the identification of cardiovascular risk factors aimed at reducing of the adverse impact of modifiable factors, such as lifestyle and pharmacological treatments. Furthermore, the evaluation of early and reliable risk factors can be used to identify high-risk subjects before the irreversible effects of the disease (early diagnosis). A growing number of scientific evidence suggests that effective prevention strategies are feasible and useful, also from the economic viewpoint [3].

An increasing number of studies focus on the role of reactive oxygen species (ROS) in the pathogenesis of premature ageing as well as of numerous civilization diseases, such as cardiovascular diseases. It has been suggested that higher antioxidant potential can protect the organism against undesirable ROS activity and thus prevent disease incidence [4]. However, the present state of knowledge on such dependence is still not complete. Antioxidants, including various agents such as enzymes (glutathione peroxidase, superoxide dismutase, and catalase), large molecules (albumin and ferritin), and small molecules (uric acid, glutathione, bilirubin, vitamin C, and vitamin E), play an important role in the cellular protection cascade against oxidative damage [5]. The total antioxidant status (TAS) mirrors the activity potential of the antioxidant system. Several methods have been introduced to measure the total antioxidant capacity (TAC) in different biological specimens. The measurement of TAC reflects the antioxidative status of plasma because antioxidative effects of the plasma antioxidant components are additive [6].

Aims and objectives

The main objective of the study is to analyze the level of antioxidants as a biomarker of cardiovascular risk in young people.

MATERIAL AND METHODS:

This cross sectional study was conducted in Shaikh Zayed Hospital, Lahore during October 2018 to January 2109. The data was collected from 100 patients of CVD. The data was collected for the analysis of blood antioxidants level among these patients. Blood sample was drawn for the analysis of serum antioxidants. Blood was centrifuged at 4000 rpm for the separation of serum. Then we find the serum antioxidantslevel by using Ohkawa et al., method.

Statistical analysis

The data was collected and analyzed using SPSS version 19. All the values were expressed in mean and standard deviation.

RESULTS:

The data was collected from 100 CVD patients. The mean age of the study patients was 54.4±10.6 years. Cigarette smoking was much more common in men than in women (32.6% vs. 0, p<0.001). The serum levels of creatinine, uric acid, and cTAS were significantly higher in men than in women (0.9±0.2 vs. 0.7±0.1, 7.6±2.1 vs. 6.8±2.3, and.0.4±0.0 vs. 0.3±0.1, respectively; p<0.001).

Table 01: Clinical and laboratory characteristics of patients with and without CAD in whole and in subgroups separated by gender

	All patients		
	Control	**CVD**	***P-value***
Age, years	49.20±10.70	56.95±9.53	<0.001
BMI, kg/m^2	27.36±4.55	28.04±4.25	0.237
Hypertension	27 (30.7)	78 (44.8)	0.027
Diabetes	4 (4.5)	36 (20.7)	0.001
Hyperlipidemia	39 (44.3)	117 (67.2)	<0.001
FH of CAD	8 (9.1)	25 (14.4)	0.223
FBS, mg/dL	102.93±36.77	119.23±43.39	0.002
Gensini score	0	28.5 (8 to 59)	<0.001
LVEF, %	54.30±5.90	50.79±9.28	0.002
cTAS, mmol/L	0.37±0.89	0.39±0.93	0.050

DISCUSSION:

Previous studies provided confusing results on the relationship of the presence of cardiovascular diseases to TAC. Several studies found significantly lower blood antioxidants and TAC in patients with CHD [7]. Similarly, several studies found that in metabolic syndrome and HA patients exhibit decreased antioxidant protection and increased lipid peroxidation. However, no significant changes of TAC were observed during and after the incidence of MI or between hypertensive patients and normal controls [8]. Vassalle et al. identified higher values of TAC measured by OXY-adsorbent test in hypertensive individuals in comparison to subjects without HA. Elevated values of TAC were also found in patients with atherosclerosis in comparison with healthy age-gender-matched counterparts [9].

Each measure of antioxidant status has its own limitations. Direct measurement of ROS has been described, but these species are transient in nature; the procedure is complex, and the results have not always shown to be reliable. The methods for calculating measured TAS (mTAS), measurement of TAS levels in the plasma using a spectrophotometer, are relatively inexpensive and usually straightforward [10]. However, colorimetry as one of the most widely used methods for measuring total oxidant status involves either fluorescence or chemiluminescence, which requires sophisticated techniques; these technologies are unavailable in many routine clinical biochemistry laboratories, or even if available, their routine use is limited [11].

CONCLUSION:

It is concluded that age was not a determinant affecting the antioxidative barrier, regardless of the presence of CHD. We showed through a cross-sectional analysis on a large healthy population that a reduced antioxidant capacity is significantly associated with cardiovascular risk factors.

REFERENCES:

1. J. S. Berger, C. O. Jordan, D. Lloyd-Jones, and R. S. Blumenthal, "Screening for cardiovascular risk in asymptomatic patients," Journal of the American College of Cardiology, vol. 55, no. 12, pp. 1169–1177, 2010.
2. E. M. deGoma, R. L. Dunbar, D. Jacoby, and B. French, "Differences in absolute risk of cardiovascular events using risk-refinement tests: a systematic analysis of four cardiovascular risk equations," Atherosclerosis, vol. 227, no. 1, pp. 172–177, 2013.
3. M. Pisoschi and A. Pop, "The role of antioxidants in the chemistry of oxidative stress: a review," European Journal of Medicinal Chemistry, vol. 97, pp. 55–74, 2015.
4. Montezano, M. Dulak-Lis, S. Tsiropoulou, A. Harvey, A. M. Briones, and R. M. Touyz, "Oxidative stress and human hypertension: vascular mechanisms, biomarkers, and novel therapies," The Canadian Journal of Cardiology, vol. 31, no. 5, pp. 631–641, 2015.
5. Ceconi, A. Boraso, A. Cargnoni, and R. Ferrari, "Oxidative stress in cardiovascular disease: myth or fact?" Archives of Biochemistry and Biophysics, vol. 420, no. 2, pp. 217–221, 2003.
6. N. A. Strobel, R. G. Fassett, S. A. Marsh, and J. S. Coombes, "Oxidative stress biomarkers as predictors of cardiovascular disease," International Journal of Cardiology, vol. 147, no. 2, pp. 191–201, 2011.
7. R. Kohen and A. Nyska, "Oxidation of biological systems: oxidative stress phenomena, antioxidants, redox reactions, and methods for their quantification," Toxicologic Pathology, vol. 30, no. 6, pp. 620–650, 2002.
8. R. Schnabel and S. Blankenberg, "Oxidative stress in cardiovascular disease: successful translation from bench to bedside?" Circulation, vol. 116, no. 12, pp. 1338–1340, 2007.
9. S. Blankenberg, H. J. Rupprecht, C. Bickel et al., "Glutathione peroxidase 1 activity and cardiovascular events in patients with coronary artery disease," The New England Journal of Medicine, vol. 349, no. 17, pp. 1605–1613, 2003.
10. U. Cornelli, R. Terranova, S. Luca, M. Cornelli, and A. Alberti, "Bioavailability and antioxidant activity of some food supplements in men and women using the D-Roms test as a marker of oxidative stress," The Journal of Nutrition, vol. 131, no. 12, pp. 3208–3211, 2001.
11. M. Carratelli, L. Porcaro, M. Ruscica, E. De Simone, A. A. Bertelli, and M. M. Corsi, "Reactive oxygen metabolites and prooxidant status in children with Down's syndrome," International Journal of Clinical Pharmacology Research, vol. 21, no. 2, pp. 79–84, 2001.