ORIGINAL ARTICLE
SERUM LEPTIN LEVELS IN PATIENTS WITH CORONARY ARTERY DISEASE

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Background: Cardiovascular diseases (CVD) are the leading cause of morbidity, mortality and disability worldwide. Leptin, a 16kDa product of ob gene, is an endocrine hormone produced by white adipose tissue. It is primarily involved in the regulation of food intake and energy expenditure. Hyperleptinemia is one of the novel risk factors contributing in many ways to CVD. Objective: The objective of the study was to find the level of leptin in patients with coronary artery disease (CAD) and compare it with healthy people in our population. Methods: Our study was an analytical and cross-sectional study. Our study included 60 patients with a history of CAD and 60 healthy controls (aged 40–60 years, both sexes). Leptin levels were measured by ELISA. Results: Mean serum leptin level in patients was 11.48±11.25 ng/ml, while control group had a mean leptin level of 8.22±8.01 ng/ml (t=0.071). Conclusion: Leptin levels were higher in patients but the difference was non-significant. More studies are needed with larger sample size in our population.

Keywords: Coronary Artery Disease (CAD), Leptin

INTRODUCTION

Coronary Artery Disease is the epidemic of our time and set to remain the single most important disease in the world in terms of mortality, morbidity, disability and economic loss until 2020 year. Despite many conventional risk factors, 50% of the CAD still remains unexplained. This led to the discovery of novel risk factors, which might cause CAD. Leptin is one such risk factor discovered by positional cloning of the ob gene. Ob gene is located on chromosome 7q31.3.

Leptin, is a 167-amino acid protein with a molecular mass of 16 kDa. Its name is derived from the Greek word ‘leptos’ which means ‘thin’. Leptin, an important signal in regulation of adipose tissue mass and body weight, operates by inhibiting or stimulating food intake and energy expenditure through release of several neurotransmitters, by acting on the receptor site in the hypothalamus. Leptin may be structurally similar to proteins of the long-chain helical cytokine family, including IL-2, IL-12 and growth hormone. Leptin is involved in the regulation of reproduction, immune function, blood pressure, renal function, bone formation, angiogenesis and vascular disorders.

The biologic activities of leptin on target tissues are carried out through selective binding to a specific leptin receptor. Leptin receptor exists in at least 6 isoforms, Ob-Ra through Ob-Rf. All leptin receptors share the common extracellular (except Ob-Re) and transmembrane domains but differ in their intracellular domains. Among these isoforms, only the long isoform (Ob-Rb) is fully functional. The structure of the leptin receptor is similar to that of the helical gp130 cytokine receptor (class-I). Leptin receptors perform signal transduction through JAK-STAT pathway.

Elevated plasma leptin level in obese individuals reflects increased amount of adipose tissue and desensitisation of leptin signal referred to as leptin resistance. Gene expression of leptin undergoes significant seasonal fluctuations associated with food availability, body reserves, and day length. Serum leptin levels follow a circadian rhythm, with a peak during the night. Compared with males, females have higher leptin levels because of their different body fat distribution or the inducing effects of hormones.

Leptin through various mechanisms has been linked to cardiovascular outcomes and it may be used as a maker for the diagnosis of CHD.

The objective of this study was to see the level of leptin in patients with coronary artery disease (CAD) and compare it with healthy people in our population.

MATERIAL AND METHODS

This is a cross-sectional study conducted in University of Health Sciences, Lahore. Sixty patients within 40–60 years of age (both sexes), with angiographically proven CAD and 60 age and sex matched controls with no history of angina pectoris or myocardial infarction were included in the study. Patients with diabetes mellitus, renal and liver diseases were excluded from the study. Fasting venous blood samples of patients and controls were taken. Leptin levels were measured by using biosource leptin EASIA kit (Catalogue Number KAP2281, Bio-Source Europe S.A.) based on sandwich ELISA. The data was analysed using SPSS-16.

RESULTS

Serum leptin levels in patients ranged from 0.36 to 41.52 ng/ml. The mean serum leptin level in patients was 11.48±11.25 ng/ml. In controls, the leptin levels...
ranged from 0.22 to 30.87 ng/ml with a mean value of 8.22±8.01 ng/ml. No statistically significant differences were observed in the leptin levels of patients and controls (p=0.071).

DISCUSSION

Leptin levels were higher in patients as compared to controls but the difference was non-significant. In a study by Galluccio et al 2003 leptin level in patients was 9.6±5.8 while in controls it was 6.0±3.8 ng/ml. These values are comparable to our results. Dassheng et al 2003 also verified hyperleptinemia in CHD patients. Abdella et al 2004 like our study could not find a significant difference in leptin levels of patients and controls. This may be due to the potential confounding effect of treatment with aspirin and statins. In a study by Wallace et al 2003 leptin levels were 16% higher in cases than in controls and higher leptin concentrations were associated with higher risk of a future coronary events. Leptin levels were higher in patients with MI compared to controls in studies by Tanelli et al 2004, Tamer et al 2005 and Soderberg et al 2008. Schulze et al 2006 observed that patients with congestive heart failure exhibit elevated plasma leptin levels.

CONCLUSION

It is concluded that patients with a history of myocardial infarction or angina pectoris have higher leptin levels compared to healthy controls but the differences were not significant. More detailed studies with larger number of patients are needed to be done in our population.

ACKNOWLEDGEMENTS

A gratitude to Dr. Abdul Ghaflar Khan, Dr. Asim Mumtaz and Dr. Shahjahan for their support in research work. We are thankful to Mr. Waqas Sami for his assistance in statistical evaluation and my colleagues for their support.

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