

Free Fatty Acids as a Predictive Risk Factor of Coronary Artery Diseases

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ABSTRACT

Background: Free fatty acids (FFAs) are associated with several cardiovascular risk factors and exert harmful effects on the myocardium.

Objective: The aim of our study was to elucidate the FFAs level in patients with coronary artery disease who are angiographically proven and normal person.

Methods and Result: A total of 30 coronary artery disease (CAD) patient and 30 healthy controls were examined for fasting plasma circulating FFA. Each subject underwent a physical examination, ECG, coronary angiography, provided blood for laboratory tests, and answered questionnaires administered by trained interviewers. Body mass index, blood pressures, tobacco consumption, diabetes, fasting cholesterol level, and circulating FFA were independent risk factors for coronary artery disease. When adjusted for confounding factors, circulating plasma FFA concentration remained an independent risk factor for coronary artery disease. Circulating plasma FFA was significantly ($p < 0.001^{**}$) elevated in patients with coronary artery disease when compared to normal.

Conclusions: FFA levels are an independent predictive risk factor of CAD. A possible diagnostic use of FFAs warrants further studies, but our results may underline the importance of therapeutic approaches to influence FFA metabolism.

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Lipolysis of adipose tissue mainly contribute to circulating free fatty acids which is found to be responsible for insulin resistance and is elevated in obesity and type 2 diabetes⁽¹⁻⁴⁾. Recent studies^(5, 6) suggested that FFAs also exert negative effects on the vessel wall by triggering endothelial apoptosis and impairing endothelium-dependent vasodilation^(7, 8). The involvement of FFAs in atherosclerosis is supported by observations of an increased risk for cardiovascular disease associated with high levels of FFAs^(9, 10). Further oxidation of FFAs, requires more oxygen than glucose and is found to be the main energy source for the myocardium under physiological conditions⁽¹¹⁾. However, elevation of FFAs as observed in myocardial ischemia has been shown to increase the ischemic damage of the myocardium and to be proarrhythmic⁽¹¹⁻¹⁴⁾. The negative clinical outcome associated with elevated FFAs in myocardial infarction might be attributed to metabolic alterations like accumulation of toxic intermediates, suppression of glucose use, or mitochondrial dysfunctions^(11-13, 15, 16). Despite this compelling

evidence for a pivotal role of FFA in cardiovascular disease, the present study aimed to study the plasma FFA's level in angiographically proven coronary artery disease patients and normal. The results of our work support the fact that FFAs acts as a predictive risk factor for coronary artery disease and may promote therapeutic approaches to influence FFA metabolism.

RESEARCH METHODOLOGY

In our study 30 healthy controls and 30 ischemic heart disease patients were evaluated for plasma FFA. The healthy controls and ischemic heart disease population were recruited from the out patient and inpatient cardiology clinic at the Division of Cardiology M.S Ramaiah Memorial Hospital, Bangalore. The study was undertaken from May 2007 to December 2007. Informed written consent was obtained from each of the participants. The subjects' age was between 35 – 75 years. Subjects with preexisting hypertension, diabetes, endocrinal, autoimmune diseases and previous MI were excluded. Coronary artery disease

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