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Pathogenic gene expression of epicardial adipose tissue in CAD patients

Anagha Sahasrabudde¹ and Shailesh Umakant Pitale²

¹NKP Salve Institute of Medical Sciences, India

²CSIR, India

Background: CAD is a leading cause of mortality and morbidity world-wide. Epicardial adipose tissue is unique visceral fat depot due to its anatomical and functional contiguity with myocardium and coronaries. Though under physiological conditions, it exhibits metabolic, biochemical and thermogenic cardioprotective properties; in pathological conditions it can exert vasocrine and paracrine actions through its pro-inflammatory cytokines on myocardium and coronaries. Though role of inflammation in development of CAD is well documented, the special role played by epicardial adipose tissue is poorly understood and less studied. Plasma inflammatory biomarkers may not adequately reflect this local tissue inflammation.

Aims: To find out the pathologic functioning of epicardial fat in patients with CAD and the difference in gene expression of epicardial fat in CAD and non-CAD patients.

Materials & Methods: After obtaining Ethics Committee clearance 27 patients undergoing CABG, and 16 Controls (non- CAD patients undergoing valvular heart surgeries) were recruited in the project. Epicardial adipose tissue sample was obtained and gene expression of following molecules was studied by TaqMan real-time reverse transcription-polymerase chain reaction (mRNA): UCP-1, MCP-1, Adiponectin, ADORA, VCAM and TNF-alpha. Fasting blood sugar, insulin, lipid profile, hsCRP, Homocysteine, Vitamin D, vitamin B12, TNF-alpha and Leptin levels were also measured.

Results: TNF-alpha, MCP-1, VCAM-1 were found to be up-regulated while the expression of UCP-1, ADORA and adiponectin were down-regulated in cases as compared with controls. After applying multivariate analysis for gene expression, up-regulation of MCP-1 was found to be statistically significant ($p=0.01$). Vitamin D levels were low across the groups and there was no difference in the levels of vitamin D, vitamin B12, hsCRP, Homocysteine and TNF-alpha. Leptin levels were significantly high in cases ($p=0.018$).

Conclusion: Epicardial adipose tissue gene expression is significantly pathogenic in CAD patients with upregulation of inflammatory markers and downregulation of anti-inflammatory ones. Plasma levels of inflammatory markers may not be predictive of CAD risk.

Biography

Anagha Sahasrabudde has been working as Assistant Professor at the Department of Physiology since 2007. She has keen interest in Research with many national and international publications to her credit. Her area of interest in research is obesity, diabetes cardio-metabolic disorders and endocrinology. Her work 'Cardiac diastolic dysfunction and regional body fat distribution in insulin resistant peripubertal obese males' received award in 22nd Annual Congress of American Association of Clinical Endocrinologists held at Phoenix, Arizona from 1st – 5th May 2013. Her project 'Cord blood levels of insulin and glucose in full term pregnancies' won 2nd prize in Academy of Medical Sciences (Jan 2008). She is on editorial board of reputed journals and on reviewer board of many journals national and international including BMJ-Case Reports.

anavinay@rediffmail.com

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