Biomarkers of Atherosclerosis: Is the Evaluation Essential Preoperatively?

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Abstract

Atherosclerosis is a chronic inflammatory condition leading to various cardiovascular as well as cerebrovascular events and peripheral vascular disease (PVD). Presence of significant atherosclerosis leads to perioperative adverse events, morbidity and mortality in the high risk surgical population. The usual methods for evaluating the like hood of adverse cardiovascular or cerebrovascular events postoperatively in these set of patients depends primarily on scoring system and functional status of the cardiovascular system during preoperative assessment. The pre-existing disease activity and possible postoperative adverse cardiovascular event (CVE) can be estimated to some degree from the preoperative levels of biomarkers associated with atherosclerosis.

This mini-review summarizes the potential role of biomarkers related to the atherosclerosis process in the cardiovascular risk stratification of patients undergoing non cardiac surgery. A Med Line search of literature on atherosclerosis biomarkers in the perioperative period and adverse post-operative cardiovascular event was conducted; and thirty-three reports are added to this review.

Keywords: Atherosclerosis; Perioperative period; Biomarkers

Atherosclerosis is a chronic inflammatory process in the blood vessels that results in the formation of atheromatous plaque over the endothelial lining of blood vessels leading to stiffness and loss of elasticity of the vessel, stenosis of the artery, aneurysm formation, plaque rupture and dysfunction of endothelial cell lining [1]. Pre-existing atherosclerosis may lead to acute unanticipated myocardial infarction during the perioperative period. Unanticipated arrhythmia, congestive cardiac failure, acute coronary syndrome and cerebrovascular accidents are some other perioperative adverse events which can cause major postoperative morbidity and mortality. Apart from the various non-biochemical tests available for risk stratification, measurement of biomarkers in the blood during perioperative period can provide a clue for postoperative CVE [2-4].

reaches at 12 to 24 h and return to base line by 48 to 72 h. T e ratio of

of ET has been proved from the presence of ET receptors on the neo vessels within the atherosclerotic plaque [22] Van Beneden et al. has shown that ET-1 concentration in plasma is a prognostic indicator in patients with atherosclerosis and congestive cardiac failure. However, in the authors view plasma brain natriuretic peptide (BNP) is a better prognostic indicator than ET-1 during perioperative period.

P-Selectin: T is adhesion molecule is produced primarily by platelets that mediate monocytes rolling before they adhere to the endothelium in the initial stage of atherosclerotic plaque formation. T e critical role of P-selectin in both leukocyte recruitment and atherosclerosis progression has been con f rmed in various animal models. Blann AD and colleague demonstrated that a de f ciency of P-selectin have a protective e f ect against atherosclerosis and an increase level is associated with progression of atherosclerosis, CAD and atrial f brillation [23].

Vascular adhesion molecule-1 (VAM-1): VAM-1 is a strong predictor of atherosclerotic risk; however its role in adverse CVE is not proven [24].

Intercellular adhesion molecule-1 (ICAM-1): T e ICAM-1

30. Maahs DM, Ogden LG, Kretowski A, Snell-Bergeon JK, Kinney GL, et al. (2007) Serum cystatin C predicts progression of subclinical coronary atherosclerosis in individuals with type I diabetes. Diabetes 56: 2774-2779.

31. Kai H, Ikeda H, Yasukawa H, Kai M, Seki Y, et al. (1998) Peripheral blood levels of matrix metalloproteases-2 and -9 are elevated in patients with acute coronary syndromes. J Am Coll Cardiol 32: 368 i 372.

32. Wallace AM, McMahon AD, Packard CJ, Kelly A, Shepherd J, et al. (2001) Plasma leptin and the risk of cardiovascular disease in the west of Scotland coronary prevention study (WOSCOPS). Circulation 104: 3052 i 3056.

33. deLemos JA, Lioyd-Jones DM (2008) Multiple biomarker panels for cardiovascular risk assessment. N Engl J Med 358: 2172-2174.