Letter to the Editor

Inflammatory biomarkers of Stroke

Madam, Stroke is the third leading cause of death and the leading cause of permanent disability in the world. Most of these strokes occur in developing countries.[1] There is a paucity of epidemiological stroke data from Pakistan, however it is expected that stroke incidence in developing countries will increase despite worldwide decrease. Considering the relative contribution of the different races to the world's population, intracranial large-artery atherosclerosis may be one of the most important causes of ischaemic stroke worldwide.[2] Asians are more prone to intracranial atherosclerosis.[3] Evidence continues to accumulate to suggest important role for inflammation in atherosclerosis,[4] specifically in stroke.

Atherosclerosis is a dynamic, chronic, inflammatory condition due to a response to endothelial injury.[5] The inflammatory mechanisms at play include endothelial dysfunction, leukocyte migration, extracellular matrix degradation, and platelet activation. This current paradigm has lead to increased interest in inflammatory biomarkers, which may help elucidate pathophysiology and provide methods for quantitating inflammation.

Cytokines and acute-phase reactants such as cytokines and CRP may be surrogate markers for basal inflammation that leads to atherosclerotic plaque. In humans, serum von-Willebrand Factor may reflect endothelial cell activation that is, along with endothelial cell-leukocyte interactions, necessary for initiation of inflammatory processes. Oxidative stress leading to modification of low-density lipoprotein (LDL) is a central paradigm of atherogenesis and plaque destabilization by LDL oxidation and foam cells formation. Plasma levels of Myeloperoxidase (MPO) may indicate the extent of oxidative stress in atherosclerotic plaque. Matrix metalloproteinases (MMPs) are highly expressed in atherosclerotic plaques, with selective enrichment at the shoulder regions, may degrade fibrous cap and convert stable plaque to unstable plaque. Endothelial cells and Monocytes over express CD40 and CD40L, during platelet activation. This triggers an inflammatory response, particularly in advanced, rupture-prone plaques. Soluble CD40L binding to IIbß3 and/or CD40 may function in an autocrine loop to promote local platelet activation within developing aggregates.

Unraveling the inflammatory biomarkers may enable clinicians to predict the risk of recurrent atherothrombosis, its clinical sequelae, and design optimal therapeutic strategies.[4] Efforts must be made to understand locally relevant disease and sorting out robust clinical markers that have stability, reproducibility and ease of assay.

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