LETTER TO THE EDITOR

Circulating endothelial cells: A new predictor of myocardial infarction

Faizan Imran Bawany, Muhammad Shahzeb Khan, Asadullah Khan

Madam, People from the Indo-Asian region are highly susceptible to coronary artery disease (CAD),[1] and therefore CAD has now become the leading cause of mortality in the Indo-Pakistan subcontinent.[2] The disease is characterized by the formation of atherosclerotic plaques, which ultimately ulcerate or break. This leads to clot formation, diminishes blood flow to myocardial cells and thus induces myocardial infarction. The inflammatory process within the arterial wall denudes the endothelium and increases the number of circulating endothelial cells (CECs) in the bloodstream. CECs have now become an important biomarker to monitor arterial plaque disruption, and therefore a potential diagnostic tool to identify patients at the greatest risk of myocardial infarction. At present, no test exists that could accurately predict the risk of heart attack since all of the tests currently available for CAD detect the underlying high risk conditions, rather than an impending arterial plaque rupture.

Just recently, Bethel et al discovered a new blood test that could accurately predict heart attack risk.[3] The test uses "Fluid Phase Biopsy" technology for the detection and characterization of CECs in myocardial infarction. Peripheral blood samples were taken from 79 patients who experienced myocardial infarction, 25 healthy controls and 6 patients who were undergoing surgery for vascular disease. Cells in the assay were considered as CECs if they stained positive for DAPI, CD146 and Von Willebrand factor, and negative for CD45. The assay was also able to identify CECs by their morphological characteristics and was able to differentiate CECs from the surrounding leukocytes. The results of the study showed that significantly greater number of CECs were present in patients who had experienced myocardial infarction as compared to healthy controls. The researchers also compared their test results with another commercially available test, called CellSearch, which has previously been approved by the U.S. Food and Drug Administration.[3] The authors concluded that their test showed higher specificity for CECs as compared to CellSearch because it used a direct analysis technique and was free of bias from an enrichment stage.

According to a recent estimate, CAD is responsible for more than 50% of all deaths among Pakistani males and 90% of all sudden deaths.[4] The situation is alarming, and therefore early detection of patients who are at high risk of developing a heart attack is important. Results of Bethel et al have made this possible and this new blood test may greatly help in reducing prevalence of myocardial infarction in Pakistan.

Dow University of Health Sciences (DUHS), Karachi, Pakistan.
Correspondence: Faizan Imran Bawany. Email: faizby1@hotmail.com

References

1. Joshi P, Islam S, Pais P, Reddy S, Dorairaj P, Kazmi K et al. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. JAMA 2007; 297: 286-94.
2. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJ. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. Lancet 2006; 367: 1747-57.
3. Bethel K, Luttgen MS, Damani S, Kolatkar A, Lamy R, Sabouri-Ghomi M et al. Fluid phase biopsy for detection and characterization of circulatingendothelialcells in myocardialinfarction. Phys Biol 2014; 11: 016002.
4. Jafar TH, Jafary FH, Jessani S, Chaturvedi N. Heart disease epidemic in Pakistan: women and men atequal risk. Am Hear t J 2005; 150: 221-6.