Correlation between Vascular Endothelial Growth Factor level and the severity of the acute coronary thrombotic events

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Abstract

Background: Vascular endothelial growth factor (VEGF) is a key regulator of angiogenesis. It is thought to be implicated in the pathogenesis of atherosclerosis and in atherosclerotic plaque neovascularization and thus promotes its infiltration by inflammatory cells which may trigger plaque destabilization.

Aim of the study: To investigate the level of VEGF in acute coronary syndrome patients and whether this level is higher than in control group and to determine whether this level is positively correlated with the severity of the disease and the short in-hospital prognosis or not.

Patients and methods: 78 patients (53 males & 25 females) their age ranged between 35 & 77 yrs with a mean age of 54.7±9 yrs were classified into***: Group 1***: 31 patients presented by unstable angina. ***Group 2***: 26 patients presented by non ST segment elevation infarction. Patients were furtherly divided according to the prior statin use into: ***1A***: statin treated patients in group 1 (16 patients***), 2A***: statin treated patients in group 2 (13 patients), ***1B***: non statin treated patients in group 1(15 patients) and ***2B***: non statin treated patients in group 2 (13 patients). ***Group 3***: 21 patients with no previous history of cardiac disease presented for chest pain evaluation & their results revealed normal coronary angiogram. All patients were subjected to 12-lead ECG, echocardiography, routine labs including cardiac biomarkers, Lipid profile, measurement of the serum VEGF by quantitative enzyme linked immunosorbant assay. Coronary angiograms were scored visually into: a severity score (0–3) defined the number of vessels with a luminal stenosis ≥50%. The severity and extent of CAD was graded using a modified Gensini score.

Results:

This study showed that the serum VEGF level was significantly higher in patients presented with either unstable angina or NSTEMI & were not previously treated with statin in comparison to control patients (357.5±142.8 & 257.0±146.7 vs 74.6±53.3 pg/L respectively, P < 0.001). And that the previously statin treated patients either in unstable angina or in NSTEMI groups had lower serum level of VEGF than controls (60.9±53.3 & 43.2±47.5 vs 74.6±53.3 pg/L respectively, P: 0.009). It also revealed that of the serum VEGF level did not differ between unstable angina patients and NSTEMI patients either in previously statin treated patients or in non previously statin treated patients (60.9±53.3 & 357.5±142.8 vs 43.2±47.5 & 257.0±146.7, pg/L, P value: 0.914 & 0.065) respectively.

When patients in both groups 1& 2 were stratified into 3 groups according to the serum level of VEGF , although there was a trend toward increase of number of coronary vessels affected in high VEGF level groups (1.92±0.76 vs 2.15±0.89 vs 2.21±1.03 in low, moderate and high VEGF groups respectively, there was no significant correlation between the serum level of VEGF and the coronary artery disease severity that assessed angiographicaly using modified Gensini score (9.16±4.81 vs 10.31±4.27 vs 9.79±5.02 in low, moderate and high VEGF groups respectively, P value: NS).

Recurrent ischemic attacks were significantly higher in patients with higher serum VEGF level compared with patients with low serum VEGF level (12.0 vs 38.5 vs 68.4% in patients with low, moderate and high VEGF respectively, p value: <0.001). Regarding development of heart failure, it occurred more in patients with higher serum VEGF level compared with patients with low serum VEGF level (12.0 vs 15.4 vs 36.8% in patients with low, moderate and high VEGF respectively, p value: 0.052).However was no significant correlation between arrhythmias or development of cardiogenic shock and the serum level of VEGF.

Conclusion: VEGF serum level is higher in non statin treated patients presenting with acute coronary syndrome and it may predict an adverse in-hospital prognosis but it was no correlation between VEGF serum level and angiographically defined disease severity.

Keywords: Vascular Endothelial Growth Factor level, acute coronary thrombotic events , NSTEMI