Title: Expression level of CCR5 chemokine receptor on blood CD4+ and CD8+ T-cells plays an important role in the Ascending Aortic Aneurysm pathophysiology.

Authors: Tiwari KK[2,3], Sbrana S[1], Bevilacqua S[3], Pucci A[4], Mattioli C[2], Bianchi G[2,3], Foffa I[1], Mazzone AM[3], Andreassi MG[1], Glauber M[3]

1. National Research Council, IFC, Pisa, Italy
2. Scuola Superiore Sant' Anna, Pisa, Italy
3. Department of Adult Cardiac Surgery, FTGM, G. Pasquinucci Heart Hospital, Massa, Italy
4. Department of Pathology, University of Pisa, Pisa, Italy

Background and aim: The CC chemokine receptor 5 (CCR5) is involved in the migration of circulating NK and Th1 cells towards inflammatory sites. CCR5 expression has also been demonstrated on endothelial cells, aortic smooth muscle cells and implicated in the development of abdominal aortic aneurysm. Thoracic aortic aneurysm (TAA) is a lethal disease burdened by complications such as aortic dissection/rupture. The risk of these acute events has been related to the severity of aortic enlargement. The aim of our study is to investigate a possible role of CCR5 expression on peripheral blood CD4+ and CD8+ T-lymphocytes in the pathogenesis of TAA.

Methods: We have studied 14 patients (8 female, 6 male) with mean age of 67.35±7.70, undergoing isolated aortic valve replacement (AVR) and/or TAA surgery. Preoperatively, venous blood samples were obtained. A three colors flow cytometric analysis was performed by appropriate combinations of monoclonal antibodies directed against the following surface molecules: CD3, CD4, CD8, CCR5. Data are expressed in terms of percentage of positivity. Maximal aortic diameter (MAD) was determined by transesophageal echocardiography. For each patient we calculated the aortic size index (ASI), defined as MAD/BSA (mm/m^2).

Results: Aortic index was 21.52±3.14 mm/m^2. Nine patients underwent isolated AVR (group 1) and five patients underwent TAA surgery (group 2). The percentage of CCR5+ on CD4+ was significantly higher in group 2 (17.03±3.08 vs 13.03±2.72, p=0.0269). A trend towards a higher percentage of CCR5+ on CD8+ was observed in group 2 (22.74±8,39 vs 16.26±3.75, p=0.0653). A significant correlation between aortic index and the percentage of CD4+ and CD8+ T-cells expressing CCR5 was observed (p=0.048, R^2=0.287 and p=0.0067, R^2=0.471 respectively).

Conclusions: The correlation between the percentage of CD4+ and CD8+ T-cells expressing CCR5 and aortic index suggests the role of a T-cell immune-mediated cytotoxic mechanism in the progression of TAA disease.