Evaluation of IL4 Expression Level in Patients with Coronary Artery Disease

Taheri Z* and Amoli MM

***Abstract*—**Coronary artery disease (CAD), is an inflammatory disease. The innate and the adaptive immune systems are involved in the pathogenesis of the inflammatory disease. The aim of this study was to evaluate IL-4 expression profile in un-stimulated peripheral blood lymphocytes (PBMCs) of patients with CAD. IL-4 mRNA expression was examined using quantitative real-time PCR. We observed that IL-4 gene expression as prototype of Th2 immune response non-significantly decreased in patients with CAD compared to patients without CAD. Our data indicate that the decreased IL-4 gene expression may play an important role in the pathogenesis of CAD; However, further research are required to clarify the association between IL4 gene expression level and CAD.

***Index Terms*—**IL-4, Gene Expression, CAD.

I. Introduction

Atherosclerosis is a chronic inflammatory disease of the arterial walls, where both innate and adaptive immune system are involved[1]. While, current information regarding the underlying molecular mechanisms of the disease still remain controversial, several researches based on humans studies and animal models strongly suggest that immune systems mainly participate in development of the atherosclerotic lesions [1],[2]. Growing evidence supports the involvement of inflammatory and immune processes in development and progression of coronary artery disease (CAD) [3].

The role playe by Th2 cytokines including IL-4, IL-5 and IL-10 in CAD development is unclear [4] and is still a controversial issue [5]. Th2-cell lineage produces cytokines with anti-inflammatory properties, this pathway is known to play role in allergic disease. Th2-related cytokines seem to have either pro-atherogenic or anti-atherogenic properties. IL-4 is the prototype cytokine of this group which contributes in Th0 differentiation [1,6].

In this study, in order to examine the role of Th2 cytokines including IL-4 in pathophysiology of CAD, we determined the expression profile of IL-4 in un-stimulated peripheral blood lymphocytes (PBMCs) of patients with CAD (CAD+) and compared profile of IL-4 with those observed in un-stimulated PBMCs from individuals without CAD (CAD-).

II. Material And Methods

The study was performed on patients who underwent coronary artery angiography for evaluation of CAD at Cath Lab Center of Dr. Shariati Hospital, Tehran, Iran. Patients with >50% stenosis in vessels considered as case groups (CAD+) and normal vessels group as control (CAD-). In each group 25 patients were examined for IL-4 mRNA expression. Total RNA was extracted from 5cc of each individual's fresh peripheral blood and then cDNA was synthesized. mRNA expression was examined using quantitative real-time PCR..

III. Results

Quantitative real-time PCR analysis has shown that IL-4 mRNA expression decreased in patients with CAD compared to patients without CAD, however the difference was not statistically significant.

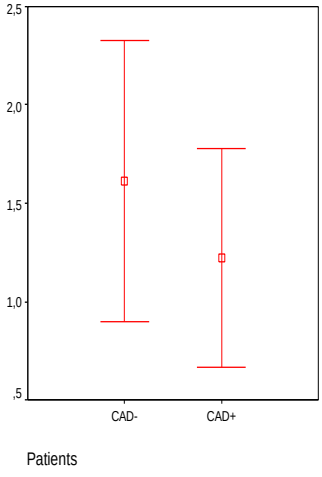

Fig. 1: IL-4 gene expression in patients with CAD+ versus CAD- individuals. (CAD^+ group = 1.2±1.3, CAD- group = 1.6±1.4) (P = 0.3)

IV. Discussion

Several lines of evidence obtained from numerous functional genomic studies support the concept that immune cells especially T cells play a pivotal role in the development of atherosclerosis [7]. IL-4 is involved in both pro-inflammatory and anti-inflammatory processes in various conditions [8]. IL-4 is archetype of this cell-lineage cytokines. Laboratory examination demonstrated that formation of fatty streak and atherosclerotic plaques were reduced in IL-4-/- mice in comparison with wild type C57/BL6 mice [9]. However, there

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are many other studies support the pro-atherogenic character of IL-4 [10]. Previous data also showed that IL-4 as one of the important anti-inflammatory cytokines is involved in CAD pathogenesis [11].

We did not observe significant alteration between IL-4 expression in CAD+ group compared to CAD- patients. This might be due to other phenotypes related to the expression of cytokines produced by Th2 cytokine with anti-inflammatory properties.

V. Conclusion

Our findings demonstrated that IL-4 mRNA expression decreased in patients with CAD compared to patients without CAD, however the difference was not statistically significant.

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