

The Relative Abundance of Important Gut Microbiota Members in Iranian CVD Patients

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Introduction: Cardio Vascular Disease (CVD) is the third most common cause of death in most countries. Atherosclerosis (AT), is defined as increased thickness of artery endothelium due to fat accumulation, is major cause of CVD. It has been demonstrated that gut microbiota as environmental factor has significant role in induction and development of AT. In this regard, relative abundance of important microbiota members (*A. muciniphila*, *lactobacillu*, *prevotellaceae* *Bifidobacterium*, *Bacteroides* and *E. coli*) were determined in CVD patient and control in Iranian population for the first time.

Material and method: 15 CVD patients and 12 healthy subject recruited From November 10, 2016 to August 28, 2018 In Tehran. The lipid profiles (cholesterol, triglyceride, LDL, HDL, VLDL) and acute phase protein (CRP) were measured by biochemical tests and SAA were measured By ELISA kit (ab100635–Serum Amyloid A (SAA) Human ELISA Kit), respectively. In order to determine the relative abundance of *A. muciniphila*, *lactobacillu*, *prevotellaceae*, *Bifidobacterium*, *Bacteroides* and *E. coli*, stool samples were collected. Following DNA extraction from samples by DNA-Extraction QIAamp® DNA Stool Mini Kit, quantitative PCR was conducted based on 16s rDNA universal primers. The bacterial abundance was calculated based on standard curve derived from *E. coli* standard strain. Finally, the frequency of these bacteria calculated. Data of biochemical test and qPCR were analyzed by SPSS software and Independent Sample t-test and Data analysis of CRP test was performed using Mann-Whitney test.

Result: Our data demonstrated that cholesterol, triglyceride, CRP and SAA of CVD group was higher compared with control group. LDL and HDL of control group was higher compared with CVD group), no significant change observed in VLDL test. Although we reported abundance change of *A. muciniphila* ($P=0.248$), *prevotellaceae* ($P=0.183$), *Bifidobacterium* ($P=0.070$) and *Bacteroides* ($P=0.668$) in CVD group compared with control group but this result is not significant. The relative abundance of *lactobacillus* was significantly decreased ($P=0.032$) and *E. coli* ($P=0.041$) in CVD group compared with control group.

Conclusion: CVD patient has significantly different relative abundance of *lactobacillus* compared with control group. According to anti-inflammatory properties of *lactobacillus* our result is parallel with the lipid profile and acute phase protein (CRP and SAA). Since reduction of *lactobacillus* relative abundance is parallel with lipid profile and acute phase protein (CRP and SAA), this could be explained anti-inflammatory properties of *lactobacillus* in gut microbiota host interaction. Determination of important of gut microbiota in CVD patient could be promising in control and treatment of AT at a certain population.