Abstract

Background: Multiple sclerosis (MS) is an inflammatory disease of the central nervous system (CNS). V-domain Ig suppressor of T cell activation (VISTA) is a new inhibitory immune checkpoint molecule that can suppress immune responses.

Aim: In this study, the level of Vsir expression in PBMCs of RRMS patients was evaluated and the pattern of Vsir expression in PBMCs of MS patients was determined. In addition, the effect of fingolimod, IFNβ-1α, glatiramer acetate (GA) and dimethyl fumarate (DMF) on the expression level of Vsir in PBMCs of RRMS patients was investigated.

Materials and methods: First, PBMC were isolated from multiple sclerosis patients and healthy individuals. Then RNA was isolated from the cells and cDNA was synthesized. Real time PCR was also used to check the expression of VISTA. Also, single-cell RNA sequencing in blood cells and cerebrospinal fluid of multiple sclerosis patients and control group was investigated using raw data of single-cell RNA sequencing in GEO.

Results: The results showed that the expression of Vsir is significantly reduced in PBMCs of patients with RRMS. In addition, single-cell transcriptomics results have shown that Vsir expression is reduced in classical monocytes, intermediate monocytes, non-classical monocytes, myeloid dendritic cells (mDC), plasmacytoid dendritic cells (pDCs) and naive B cells in PBMCs of patients with MS. Also, DMF, IFNβ-1α, and GA significantly increased the expression of Vsir in PBMCs of RRMS patients compared to the control group.

Conclusion: In summary, the present study has determined the expression of Vsir in PBMCs of patients with MS. However, further studies are needed to reveal the importance of VISTA in the mentioned immune cells.

Keywords: multiple sclerosis, VISTA, PBMC, single-cell transcriptomics