Evaluation of the miRNA-126 expression level and the serum level of sVCAM-1 in patients with systemic sclerosis and its relation with clinical characteristics

Abstract

Background: Systemic sclerosis (SSc) is a rare multiorgan disease with high mortality due to involvement of vital organs such as heart, lung, gastrointestinal tract and kidney. The pathogenesis is not fully cleared but it has been known that Microvascular changes are the first SSc event, and damaged endothelial cells may be differentiated into myofibroblasts, which are responsible for fibrosis and collagen deposition. VCAM-1 is a major regulator of leukocyte adhesion and migration. Soluble VCAM-1 has been associated with fibroblast activation and epithelial cell transition to mesenchymal, indicating the activation of immune and andothelial cells. miRNAs have Known as important modulators of endothelial homeostasis. Regulatory disruption of miRNAs is associated with dysfunction of Endothelial cells and development of vascular disease thus new opportunities to use miRNAs as potential therapeutic targets for vascular diseases. the role of miRNAs in SSC is Uncertain. miR-126 is the most abundant miRNA Generated in endothelial cells which Is responsible for vascular development, integrity and response to hemodynamic stress.

Aim: in this study, serum protein levels of VCAM-1 And expression level of miRNA-126 In patients with systmic sclerosis and control group and the relationship with clinical symptoms of the disease was evaluated.

Materials and Methods: In this case-control study, 26 samples of SSc patients referred to rheumatology clinic in Ardabil province whose diagnosis was determined based on ACR criteria and 23 samples of control group were obtained. Soluble VCAM-1 protein was measured by ELISA method and miRNA-126 expression level by Real Time PCR, then analyzed by statistical software and evaluated with clinical symptoms of patients in accordance with the designed questionnaire.

Results: Serum levels of miRNA-126 decreased significantly in the patients compared to the healthy group (P=0.02) and also there was a significant negative relationship between serum level of miRNA-126 and pulmonary symptoms including PAH and pulmonary fibrosis. VCAM-1 was significantly higher in patients than control group ($p<0.001$). there was no significant correlation between serum level of miRNA-126 and VCAM-1solution in the patient and control groups (p=0.08).

Conclusion: The results suggested that miRNA-126 and VCAM-1 may be in interaction with the pathophysiology of the disease and miRNA-126 may be useful as prognostic marker for pulmonary fibrosis and PAH.

Keywords: MiRNA -126 – Systemic sclerosis (SSc) - VCAM-1