Abstract

Background: MicroRNAs (miRNAs) are small non-coding single-stranded RNAs involved in the posttranscriptional inhibition of gene expression and thereby regulating all cellular functions. Their dysregulation contributes to the pathophysiology of many diseases, including rheumatic diseases. MiRNAs can also be found extracellularly in body fluids and represent promising diagnostic and prognostic biomarkers. Our study aimed to investigate miRNAs as biomarkers of stage and activity and predictors of therapeutic response of two most common inflammatory rheumatic diseases: spondyloarthritis (SpA) and rheumatic arthritis (RA).

Results: We found several circulating miRNAs differentially expressed in SpA patients reflecting the severity of axial involvement and/or disease activity. The decrease in circulating miR-145 in plasma of patients with ankylosing spondylitis 3 months of anti-TNF therapy predicted a good therapeutic response and low disease activity after a year of therapy. Circulating and intracellular expression of miR-125b in peripheral blood mononuclear cells (PBMC) was lower in treatment-naïve patients with early RA than in healthy controls. Baseline expression of miR-125 in PBMC predicted a (non)adequate therapeutic response. We also found the increased expression of miR-451 in PBMC in individuals with arthralgia at risk of developing RA that subsequently reduced the expression of proinflammatory CXCL16, probably aiming to delay the development of RA.

Conclusion: Our data support the use of circulating and cellular miRNAs as biomarkers of the stage and activity of the disease and as predictors of therapeutic response in inflammatory rheumatic diseases, including their earliest phases.

Key words: miRNA, biomarker, axial spondyloarthritis, rheumatoid arthritis