Relationship between MicroRNA-155 and joints ultrasound findings in Rheumatoid Arthritis patients

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Summary and Conclusions

The detection of miRNA levels in samples that are readily obtained in routine clinical practice, such as whole blood, enhances their potential utility in detecting changes in the immunological mechanisms underlying autoimmune diseases such as RA.

The diagnosis of RA is based essentially on clinical and biological parameters, although the new American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) classification criteria include MRI and ultrasound (US) as additional tools to assess objectively joint involvement.

In our study we aimed to clarify the relationship between altered expression of microRNA-155 in RA patients with the ultrasound scores for active synovitis & other disease activity parameters, We had measured micRNA-155 expression level in RA population, investigating potential relationships between micRNA-155 expression level with the ultrasound scores for active synovitis, and to correlate these results with disease activity and different disease parameters such as health assessment questionnaire and disability index.

This study included 40 patients with rheumatoid arthritis diagnosed according to the 2010 ACR/EULAR criteria ***(Aletaha et al, 2010)*** and 40

healthy controls.

The age of RA patients ranged between 25 and 55 years, with a mean of 46.65 ± 11.01 years , with median disease duration (IQR): 4 (2-8) years with 23 patients (57.5%) have a disease duration less than 5 years, and 17 patients have a disease duration more than 5years, there was 4 males (10%) and 36 female (90%), table 1.

RA patients were evaluated by history, examination, questionnaires, laboratory and radiological examination. Disease activity was assessed by DAS28, disability by HAQ-DI, and radiological damage by Sharp method. In addition, complete blood count, ESR, C-reactive protein, rheumatoid factor, Albumin level, liver enzymes, and serum creatinine.

Extraction and detection of micro RNA155 by Real Time PCR according to the manufacture′s instructions, was obtained for all individuals.

Ultrasound examination was performed to all patients with GE LOGIQ 7 PRO equipment using a linear transducer with a18 MHz frequency, All patients were assessed and examined by one medical staff. The patients were examined according to the German US7 score.

This study demonstrated the following:

- 20% of RA patients had dry eye as an extra-articular manifestation.
- We had found that 10% of RA patients had interstitial pulmonary fibrosis (IPF) as an extra-articular manifestation.
- Patients with RA showed obviously higher altered expression level of micRNA-155, compared with controls.
- There is significant positive correlation between micRNA-155 level and Sharp score & HAQ and DAS-28.
- There is significant positive correlation between micRNA-155 level and PDUS7 tenosynovitis ($r=0.990$, $p<0.001$).
- There is significant positive correlation between ESR level and PDUS7 tenosynovitis
- There is no significant correlation between microRNA-155 expression level and total US score (US), GSUS7 tenosynovitis, GSUS7 synovitis, PDUS7 synovitis and erosions.

Limitations and recommendation

The limitation of the present study was: its cross-sectional design, the small sample size and ultrasound score used (US7) which evaluate limited number of joints plus the pitfalls that may occur during ultrasound examination of the joints.

Finally, although this study is somewhat limited in statistical power and further studies with a greater number of patients are needed, our data showed that microRNA-155 has an important role in the pathogenesis of RA

This information is likely to become increasingly important as more micro RNA-directed treatments will enable a new advanced strategy toward arthritis and become part of RA management paradigms.