

The potential role of serum expression profile of long non coding RNAs, Cox2 and HOTAIR as novel diagnostic biomarkers in systemic lupus erythematosus

Abstract

Background: The role of the long non-coding RNAs (lncRNAs) in the pathogenesis of systemic lupus erythematosus (SLE) is mostly unknown, despite increasing evidence that lncRNAs extensively participate in physiological and pathological conditions.

Aim: To detect the level of lncRNA-Cox2, HOTAIR, IL-6, and MMP-9 in the serum of SLE patients and to correlate these levels with disease activity and patients' clinical and laboratory data to evaluate the value of these biomarkers for SLE diagnosis and assessment of disease activity.

Methods: Blood samples from 58 SLE patients, and 60 healthy controls (HCs) were used for detection of lncRNAs-Cox2 and HOTAIR expression levels by real-time polymerase chain reaction. Both IL-6 and MMP-9 serum levels were assayed by enzyme-linked immunosorbent assay. Lupus activity was assessed with the Systemic Lupus Erythematosus Disease Activity Index (SLEDAI).

Results: The serum expression levels of lncRNA-Cox2 and HOTAIR were significantly up-regulated in SLE patients vs HCs (fold change [median (IQR)] was 1.29(0.81–1.71, $P < 0.0001$) and 2.68(0.95–3.67), $P = 0.038$) for lncRNA-Cox2 and HOTAIR, respectively. Serum levels of both IL-6 and MMP-9 were significantly high in SLE patients compared with HCs ($P < 0.001$ for each). The up-regulated lncRNA-Cox2 was positively associated with the presence of neurological manifestations in SLE patients ($P = 0.007$). Furthermore, HOTAIR expression level had significantly positive correlation with IL-6 ($r = 0.578$, $P < 0.0001$), MMP-9 level ($r = 0.762$, $P < 0.0001$), nephritis grades ($r = 0.296$, $P = 0.024$) and proteinuria ($r = 0.287$, $P = 0.035$). lncRNA-Cox2 showed sensitivity and specificity 72.4%, and 100.0% respectively. HOTAIR sensitivity was 60.3%, and specificity was 100.0%. By multiple logistic regression analysis, lncRNA-Cox2 and HOTAIR were found as SLE independent predictors.

Conclusion: lncRNA-COX2 and HOTAIR can be used as new non-invasive biomarkers for the diagnosis of SLE