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ELEVATED SERUM INTERFERON-ALPHA ASSOCIATES WITH FLARE RISK IN JUVENILE-ONSET SYSTEMIC LUPUS ERYTHEMATOSUS

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Introduction: Despite the established role of IFN-α in the pathophysiology of Juvenile-onset Systemic Lupus Erythematosus (JSLE), its utility as a tool for monitoring disease activity has not been explored extensively.
Objectives: To assess the utility of serum IFN-α as a potential marker of disease activity, and a predictor of disease flare in JSLE patients who have reached a low disease activity state (LDAS) or remission.
Methods: Serum samples from 291 participants were analysed, including 49 healthy controls (HCs), 95 JSLE, and 52 juvenile idiopathic arthritis (JIA) patients. IFN-α levels were determined using ultra-sensitive Single-molecule array (Simoa) digital ELISA. All serum samples were analysed in duplicates, the coefficient of variation (CV) was calculated, and samples with a CV>15 were excluded. Thus, 88 serum samples were excluded and 203 samples were included in the analysis (25 HCs, 85 JSLE (148 samples), 30 JIA patients). At each visit, JSLE patients were classified as either being in: a) remission, b) LDAS, or c) having intermediate or active disease. Clinical characteristics, demographics and disease activity scores were collected. Median IFN-α levels were compared between patient groups and disease activity state sub-groups, cross-sectionally. Time-to-flare was analysed cross-sectionally by linear regression, and the ability of the IFN-α and other traditional biomarkers (erythrocyte sedimentation rate/ESR, low C3, anti-dsDNA antibodies) in predicting flare at the following visit was assessed longitudinally by generalised linear mixed model.
Results: Median IFN-α levels were higher in the combined active/intermediate group (median 3,184 fg/mL, IQR 69-14,878) as compared to both the LDAS (586 fg/mL, IQR 52-1,317 fg/mL, p=0.036) and remission sub-groups (271 fg/mL, IQR 3-56, p <0.001). IFN-α levels were comparable between JSLE patients in remission and HCs (23 fg/mL, IQR 3-277, p=0.5). IFN-α concentrations were higher in all JSLE patients (median 603 fg/mL, IQR 11-2,643) as compared to JIA patients (median 3 fg/mL, IQR 3-103, p=0.001) and HCs (p=0.016). Abnormal serum IFN-α levels were defined as >871 fg/mL (mean serum HC IFN-α level + three standard deviations). Cross-sectional JSLE patients in remission or LDAS with abnormal IFN-α levels had a shorter time-to-flare over the subsequent six months (p=0.038), compared to patients with normal IFN-α levels. Longitudinally, multivariable analysis demonstrated high IFN-α to be the only predictor of flare at the next visit (p=0.040), whereas elevated ESR, low C3, and anti-dsDNA antibodies did not predict flares.
Conclusion: Serum IFN-α levels correlate with JSLE disease activity and facilitate identification of a sub-group of patients in remission or LDAS who are at increased risk of flare.
Patient Consent: Yes, I received consent
Disclosure of Interest: None declared