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MOLECULAR AND CELLULAR BIOMARKERS THAT DISCRIMINATE JUVENILE IDIOPATHIC ARTHRITIS FROM SEPTIC ARTHRITIS

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Career situation of first and presenting author Student for a master or a PhD.

Introduction Juvenile idiopathic arthritis (JIA) and septic arthritis (SA) are the most frequent cause of arthritis among children under the age of 16 years. JIA is an inflammatory disorder with articular inflammation that persists for more than 6 weeks, while SA is caused by bacterial infection in children joints. Although these diseases have different pathophysiological basis and involve different treatments and prognoses, they share clinical similarities.

Objectives To date, there are no markers sufficiently reliable to discriminate between these two forms of arthritis at the onset of the disease. Our goal is to identify diagnostic biomarkers capable of discriminating between JIA and SA. To that end, we focused on microRNAs (miRNAs) and myeloid cell subsets, both playing a major role in the immune system.

Methods We analyzed serum and synovial fluid (SF) samples from JIA or SA patients using a miRNAs Whole Transcriptome Assay associated with a next-generation sequencing detection technology to measure the expression level of 2083 miRNAs in a pilot study (oligoarticular JIA (oJIA): n=5; SA: n=3) and validated using RT-qPCR in a replicative study (oJIA: n=9; SA: n=9). In parallel, we performed a phenotypic characterization of peripheral blood (PB) and SF myeloid subpopulations using a flow cytometer (oJIA: n=9; SA: n=8).

Results Principal component analysis and hierarchical clustering characterizations did not show significant differences between serum miRNAs of oJIA and SA patients. However, we observed a distinct miRNA profile signature in SF between the two diseases with 16 upregulated miRNAs and 5 downregulated that perfectly discriminates oJIA and SA (p<0.01). In addition, phenotypic characterization revealed the existence of 5 myeloid cell subsets with distinct accumulation profile between the SF of oJIA and SA (p<0.05).

Conclusions In this study, we propose for the first time a SF-based miRNA signature as well as 5 myeloid cell subsets that discriminate between oJIA and SA and might be used as potential diagnosis markers in juvenile arthritis. Moreover, these markers give an insight into the mechanisms that are differentially altered between inflammatory and infectious arthritis.

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IMPACT OF DISEASE ACTIVITY, DURATION AND MUSCLE INVOLVEMENT ON CHANGES OF BODY COMPOSITION IN MYOSITIS PATIENTS

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Introduction Skeletal muscle, pulmonary and articular involvement in idiopathic inflammatory myopathies (IIM) limit the mobility/self-sufficiency of patients, and can have a negative impact on body composition.

Objectives To assess body composition and physical activity of IIM patients and healthy controls (HC).

Methods 54 patients with IIM (45 females; mean age 57.7; disease duration 5.8 years; PM, 22/DM, 25/IMNM, 7) and 54 age-/sex-matched HC (45 females, mean age 57.7) without rheumatic/tumor diseases were included. PM/DM patients fulfilled Bohan/Peter criteria for PM/DM. We assessed anthropometric parameters and body composition (by densitometry: iDXA Lunar, and by bioelectric impedance: BIA2000-M), and physical activity (by Human Activity Profile questionnaire, HAP). Routine biochemistry analysis was performed after 8 hours of fasting. Disease activity was evaluated by MITAX and MYOACT activity score, muscle involvement by manual muscle test (MMT-8) and functional index 2 (FI2).

Results Compared to HC, patients with IIM had significantly increased body fat% (BF%) but significantly decreased lean body mass (LBM), bone mineral density (BMD) and increased extracellular mass/body cell mass (ECM/BCM) ratio, which reflects worse muscle predispositions for physical activity and deteriorated nutritional status. Disease duration negatively correlated with BMD and LBM (assessed by BIA). Disease activity assessed by MITAX and MYOACT positively correlated with LBM (assessed by both BIA and DXA), as well as with basal metabolic rate (BMR), and fat free mass (FFM). CRP was positively associated with BF% (iDXA and BIA). Higher BF% (iDXA) was associated with worse physical endurance (FI2) and worse ability to perform physical activity (HAP). MMT-8 score negatively correlated with ECM/BCM ratio.

Conclusions We found significant negative changes in body composition of our IIM patients compared to healthy age-/sex-matched individuals, associated with their disease activity and duration, inflammatory status, skeletal muscle involvement, and physical activity. These data could reflect their impaired nutritional status and predispositions for physical exercise, aerobic fitness and performance.