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OP0034

A NOVEL SERUM CALPROTECTIN (MRP8/14) PARTICLE ENHANCED IMMUNO-TURBIDIMETRIC ASSAY (SCAL TURBO) HELPS TO DIFFERENTIATE SJIA FROM OTHER DISEASES IN ROUTINE CLINICAL LABORATORY SETTINGS

Keywords: Innate immunity, Diagnostic Tests, Biomarkers

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Background: Differential diagnosis in children with signs of unprovoked inflammation can be challenging. In particular, differentiating systemic-onset juvenile idiopathic arthritis (SJIA) from other diagnoses is difficult in individuals presenting with fever of unknown origin. We have recently validated myeloid-related protein 8/14 (MRP8/14, S100A8/A9, calprotectin) serum analyses as a helpful tool supporting the diagnosis of SJIA. The results could be confirmed with a commercial ELISA. However, further optimization of the analytical technology will be important to enable large-scale use in routine laboratory settings.
Objectives: To evaluate the accuracy in identifying children with SJIA, the performance of an immunoturbidimetric assay for measurements of serum-calprotectin (BÜHLMANN sCAL turbo) on an automated laboratory instrument was tested in serum samples of children with various conditions.
Methods: Samples from 650 children were available with diagnoses SJIA (n=99), non-systemic JIA (n=169), infections (n=51), other inflammatory diseases (n=161), and acute lymphatic leukemia (ALL, n=147). In addition, samples from 23 healthy controls were included. The patients with systemic inflammatory diseases were collected at Muenster University as reported before.[1] Patients with non-systemic JIA were from the Nordic JIA cohort as previously described in detail.[2] The ALL cohort included consecutive cases from Aalborg and Aarhus University Hospitals.[3] The BÜHLMANN sCAL turbo test is a particle enhanced immuno-turbidimetric assay (PETIA) and was compared to the established MRP8/14 ELISA from BÜHLMANN (EK-MRP8/14). The sCAL PETIA has a range of 230-15,000 ng/mL (extended range up to 225,000 ng/ml by dilution of 1:15) in sample volumes of only 2-3 µl and was implemented into the automated laboratory setting at the central clinical laboratory of the University Hospital Muenster as a rapid test available on demand.
Results: The sCAL turbo assay showed an excellent correlation to the MRP8/14 ELISA used in the previous validation studies (r=0.99, p<0.001). It could reliably differentiate SJIA from all other diagnoses with significant accuracy (cut-off at 9,100 ng/ml, sensitivity 93%, specificity 87%, ROC area under curve 0.961, p<0.001). Results are shown in Table 1 and Figure 1.

Table 1. Accuracy (ROC analyses) of sCAL turbo measurements in differentiating groups of patients

	SJIA vs all groups	*SJIA vs infections*	*SJIA vs ALL*	*SJIA vs others*
AUC (95%CI)	0.961 (0.943-0.978)	0.908 (0.862-0.953)	0.992 (0.985-0.999)	0.958 (0.934-0.981)
Cut-Off (ng/ml)	9,100	10,500	9,100	9,100
Sensitivity (%)	93	82	99	93
Specificity (%)	87	84	87	86

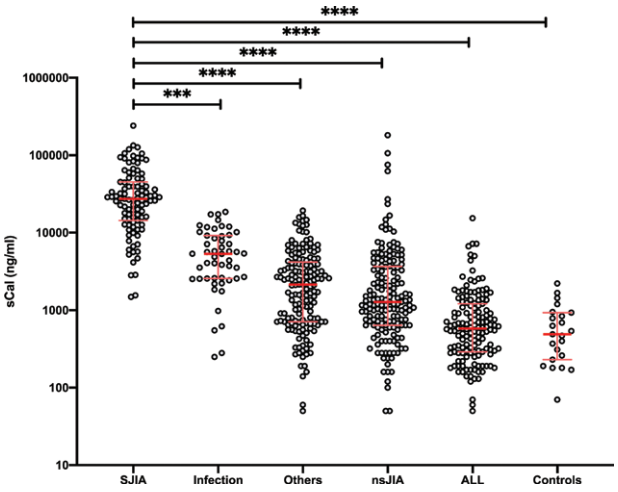

Figure 1. Results of sCAL turbo measurements in different groups of patients (red line showing median, error bars showing interquartile range; *** p<0.001, **** p<0.0001)

Conclusion: MRP8/14 (S100A8/A9, calprotectin) serum analyses have been validated as a helpful tool supporting the diagnosis of SJIA in children with prolonged fever or inflammatory disease. Here we show that an immunoturbidimetric assay for detection of serum-calprotectin on an automated laboratory instrument can be implemented in clinical laboratory settings to facilitate its use as a diagnostic routine test in clinical practice.
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OP0035

THE USE OF CHILDHOOD LLDAS: FIRST RESULTS IN A REAL-LIFE LONGITUDINAL CHILDHOOD LUPUS COHORT SHOW GOOD FEASIBILITY BUT DIFFICULT ATTAINMENT

Keywords: Treat to target, Systemic lupus erythematosus

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Background: Almost half of childhood-onset SLE (cSLE) patients show damage within 5 years after disease onset, which is partially disease- and partially

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