Methods: We included data about 90 JIA (26 M and 64 F) aged from 2 to 17 years, who received scheduled vaccination before the age of 2 years and before JIA onset. In all patients the Ig G anti-measles (AM), anti-parotitis (AP), anti-hepatitis B (AHB), anti-diphtheria (AD) and anti-rubella (AR) AVA levels were detected with ELISA. In each patient we evaluate the type of the JIA (oligoarthritis – OA (n=38), polyarthritis – PA (n=36), systemic-SA (n=7) and enthesitis-related arthritis – ERA (n=10), routine disease activity and treatment. In healthy controls were measured anti-measles (n=40) and anti-parotitis (n=30) antibodies (AB) for comparison with JIA.

Results: The main demographic characteristics: age of inclusion in the study 11 (8-15) years, disease onset–6 (4-8) years, JIA duration–4 (2-7) years. The AM AB in JIA patients were 0.2 (0.0-0.5) IU/ml and in HC 0.3 (0.2-1.1) IU/ml ($p=0.00002$), despite the higher age of JIA patients than HC ($p=0.0000001$); AP AB were 2.6 (1.0-5.1) IU/ml vs 1.1 (0.0-4.9) IU/ml in JIA and HC, respectively ($p=0.08$). Protective levels of AM AB was detected in 50% of all JIA population, vs. HC – 87.5% ($p=0.00005$), AP–67.7% vs. 60% in HC ($p=0.076$), AHB – 54.4%, AD–50%, AR–97.8%. The main data related to vaccination status in the table. We have found correlation between JIA duration and levels AM AB ($r=0.27$, $p=0.015$), AP AB ($r=0.22$, $p=0.039$), AD AB ($r=0.27$, $p=0.015$); MTX treatment with AM AB ($r=0.37$, $p=0.001$), and AD AB ($r=0.29$, $p=0.007$); treatment with biologics and AM AB ($r=0.25$, $p=0.018$), and using more than one biologics with AR AB ($r=0.27$, $p=0.047$). In the regression model only MTX had a negative impact on AM ($r=-0.001$) and AD AB level ($p=0.01$).

Parameter	OA	PA	SA	ERA	P
Onset age, y	5 (4-7)	6 (4-8)	8 (4-11)	9 (7-12)	0.01
JIA duration, y	3 (2-5)	5.4 (2-9)	4 (1-6)	6 (5-10)	0.006
# AM vaccinations	2 (1-2)	2 (1-2)	1 (1-2)	2 (2-2)	0.005
# of patients with AM revaccination, %	51	60	43	100	0.06
AM IgG, IU/ml	0.2 (0.0-0.6)	0 (0-0.4)	0.2 (0; 1.6)	0.2 (0.1-0.3)	0.2
Protective AM IgG level, %	58	39	57	50	0.42
# of patients with AP revaccination, %	50	61	43	100	0.05
# AP vaccinations	1.5 (1-2)	2 (1-2)	1 (1-2)	2 (2-2)	0.004
AP IgG, IU/ml	3 (1.5-5)	2.3 (0-5)	1.3 (0; 5)	2.6 (1.1-3.3)	0.67
Protective AP IgG level, %	82	72	71	75	0.8
# AD vaccinations	4 (4-5)	5 (4-5)	4 (4-5)	5 (4-6)	0.09
AD IgG, IU/ml	0.1 (0.03-0.3)	0.1 (0.03-0.2)	0.04 (0.0; 0.2)	0.16 (0.05-0.4)	0.64
Protective AD IgG level, %	53	50	29	50	0.71
# AHB vaccinations	3 (3-3)	3 (3-3)	3 (3-3)	3 (3-3)	0.87
AHB IgG, IU/ml	5 (0-20)	17 (2-45)	1 (0; 10)	19 (4-228)	0.09
Protective AHB IgG level, %	45	67	29	63	0.13
# AR vaccinations	1 (1-2)	1 (1-2)	1 (1-1)	2 (2-2)	0.57
AR IgG, IU/ml	72 (35-145)	54 (27-96)	200 (18; 200)	67 (42-2000)	0.52
Protective AR IgG level, %	100	97	100	100	0.69

Conclusion: Children with JIA are in the risk of decreased level of AVA, especially in measles, diphtheria and parotitis. The measurements of AVA in the individual JIA vaccination schedule required.

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THU0542

THE PSYCHIATRIC DISORDERS IN CHILDHOOD, ADOLESCENCE AND YOUNG ADULTS WITH JUVENILE IDIOPATHIC ARTHRITIS PATIENTS IN FINLAND

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Background: Reported psychiatric morbidity among juvenile idiopathic arthritis (JIA) patients has varied between 9.3-51% (1-3). The variation between studies can be explained by differences in the study populations (age, disease duration and disease state) and differences in the study

methods (1-3). Depression and anxiety are the most common disorders, but most studies were based on questionnaires to investigate incidence of only these two diseases (1,3).

Objectives: To explore mental and behavioral disorders in JIA patients compared to the control population.

Methods: All incidents patients with JIA during 2000-2014 were collected from the nationwide register, maintained by the Social Insurance Institution of Finland (4). The National Population Registry identified three controls (similar regarding age, sex and residence) for each case. They were followed up together until 31st Dec 2015. ICD-10 codes of psychiatric diagnosis (F10-F99) were picked up from the Care Register for Health Care of the National Institute for Health and Welfare.

Results: During 28,941 follow-up years, 974 (23%) JIA patients were diagnosed with mental or behavioral disorders, whereas the number in the control group was 1,807 (15%), ($p<0.001$). Neurotic, stress-related and somatoform disorders (F40-48) and mood (affective) disorders (F30-39) were the most common psychiatric diagnoses in the JIA (10.41% and 8.18%) and in the control group (5.44% and 5.13%). The odds ratio for neurotic disorders (F40-48) was 2.02 (95% CI 1.78-2.29) and for mood disorders (F30-39) 1.65 (95% CI 1.44-1.89). Additionally, JIA was statistically significantly associated with behavioral and emotional disorders and disorders of psychological development (Table). Female patients with JIA had higher odds ratios than males for all mental and behavioral disorders except behavioral syndromes (F50-59), for which males with JIA had higher odds ratio.

Conclusion: The risk of psychiatric disorders in JIA patients is increased.

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Abstract THU0542 –Table 1. Percentages and odds ratios (OR) for psychiatric disorders in JIA compared to controls

Psychiatric disorders (ICD-10)	JIA n/ %	Controls n/%	OR (95% CI)
Mental and behavioral disorders due to psychoactive substance use (F10-19)	70/ 1.67	212/1.69	0.99 (95% CI 0.75-1.30)
Schizophrenia, schizotypal and delusional disorders (F20-29)	31/ 0.74	68/0.54	1.37 (95% CI 0.89-2.09)
Mood (affective) disorders (F30-39)	342/ 8.18	642/5.13	1.65 (95% CI 1.44-1.89)
Neurotic, stress-related and somatoform disorders (F40-49)	435/ 10.41	681/5.44	2.02 (95% CI 1.78-2.29)
Behavioral syndromes (F50-59)	134/ 3.21	204/1.63	2.00 (95% CI 1.60-2.49)
Disorders of adult personality and behavior (F60-69)	34/ 0.81	80/0.64	1.27 (95% CI 0.85-1.91)
Disorders of psychological development (F80-89)	192/ 4.59	414/3.31	1.41 (95% CI 1.18-1.68)
Behavioral and emotional disorders and unspecified mental disorder (F90-99)	192/ 4.59	414/3.31	1.41 (95% CI 1.18-1.68)

Disclosure of Interests: None declared

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THU0543

LATENT TUBERCULOSIS INFECTION IN CHILDREN WITH PEDIATRIC RHEUMATOLOGIC DISEASES TREATED WITH CANAKINUMAB

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Background: Little is known about the long-term safety of canakinumab about tuberculosis (TB) risk in paediatric rheumatologic diseases.

Objectives: To determine the incidence of latent tuberculosis infection and evaluate the follow-up protocol of the patients treated with canakinumab in a single pediatric rheumatology center from a TB-medium burden country.

Methods: The hospital charts of patients treated with canakinumab between 2012 and 2019 were retrospectively reviewed. The patients were screened for TB using tuberculin skin test (TST) and/or QuantiFERON-TB Gold (QFT-G) test. They had no history of active TB prior to screening and no signs or symptoms of active TB. None of the patients had recent close contact with a person diagnosed as active TB. At initial evaluation, in patients who had never been given immunosuppressive therapy, TST ≥ 15 mm (if BCG vaccinated) and TST ≥ 10 mm (if BCG unvaccinated) were considered as positive. In the case of prior immunosuppressive drug use TST cut-off limit was accepted as 5 mm. Patients with either a positive TST or QFT-G result, in whom active TB ruled out, were to receive appropriate treatment for latent TB one month prior to the first dose of canakinumab and continue throughout 9 months. Chest radiographs were performed prior to therapy and every 6 months. In case TST was anergic, both chest X-ray and TST were repeated after 3 months. Patients were evaluated for signs and symptoms of active TB by an infectious disease specialist every 3 months while on canakinumab therapy according to the "guidelines of Ministry of Health for use of biologic agents". The TST conversion was considered as a variation ≥ 5 mm between the two TSTs performed within an interval at least 3 months. If TB was suspected during the study, repeat TB testing (TST, QFT-G, and chest radiograph) was recommended.

Results: 29 Familial Mediterranean fever, 6 systemic juvenile idiopathic arthritis, 1 TRAPS and 1 hyper Ig D syndrome patients were evaluated. The mean age at canakinumab onset was 12.4 ± 4.3 years (min: 2, max: 17 years). The average duration of canakinumab use was 2.3 ± 1.4 years (min: 1 max: 6.5 years). Among 37 patients, 5 patients had positive TST and one had positive QFT-G with normal chest X-ray prior to therapy. They were given isoniazid prophylaxis for latent TB. QFT-G was checked in 6 patients prior to canakinumab, 5 were negative. Seven patients had TST conversion during follow-up. Their chest X-rays were normal. None of them had active TB symptoms, such as; cough, fever, night sweats and weight loss. The mycobacterial cultures, mycobacterium tuberculosis PCR of induced sputum (via hypertonic saline nebulization) or morning gastric aspirates were negative in these patients. QFT-G was checked in 10 patients during follow-up and all were negative. None of the patients experienced active TB during follow-up.

Conclusion: To the best of our knowledge, this is the first study investigating the frequency of latent tuberculosis infection among patients treated with canakinumab. The results of this study suggest that although frequency of latent TB infection in children treated with canakinumab may not be low in a TB-medium burden country, canakinumab seems to be a safe treatment option in terms of active tuberculosis risk. Close follow-up of children on canakinumab treatment with respect to TB by the pediatric infectious disease department is important to prevent possible complications.

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THU0544 ULTRASOUND EVALUATION OF UPPER LIMBS ENTHESES AND JOINTS IN HEALTHY CHILDREN

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Background: Enthesitis in children can result from mechanical or inflammatory processes. Enthesitis is a common finding in several JIA categories, particularly in ERA. Most of the available data on the potential application of ultrasound (US) for paediatric enthesitis is currently focused on lower extremity with limited data in upper extremity entheses. To know how normal US findings of extremities by age are lead to early diagnosis and might avoid misinterpretations.

Objectives: To describe the age-related sonographic features of tendon insertions in the elbows and shoulders in healthy children.

Methods: This is a prospective cross-sectional study of 43 healthy volunteer children. Selection criteria: free of musculoskeletal symptoms, medical conditions or medication affecting the MSK system assessed by a paediatric rheumatologist. Exclusion criteria: history of trauma/surgery, family history of spondyloarthritis and more than three hours of physical activity the previous week of the evaluation. Children were grouped according to age: group 1 (3–9 years, n=22), group 2 (10–13 years, n=12) and group 3 (14–18 years, n=9).

The supraspinatus, common extensor, common flexor, and triceps tendon insertions were bilaterally examined in Power Doppler (PD) as well as grey-scale US using a GE Logic e machine with a linear transducer [8–13 MHz]. All entheses were evaluated in the longitudinal and transverse planes. Additionally, the corresponding joint was examined. Since there was no examination protocol available for scanning upper limbs entheses, a preferred US protocol for scanning children was used (1). Detailed description of entheses in grey-scale and Doppler modes was collected: echogenicity, thickness, presence of power Doppler signal (intra-enthesal at the bone/cartilage interface, peri-enthesal and within the unossified cartilage), as well as potential lesions (enthesophytes, erosions and calcifications). Measurement of tendon thickness was taken using US calipers at the site just where the tendon first contacts bone. All images were acquired by a single examiner (VM) and read by two readers. The inter-observer reliability for the tendon thickness measurements and Doppler signal was estimated between the two readers.

Results: A total of 344 entheses were evaluated in 43 healthy children. Children had a median age of 9 years (IQR 6-13) and 55% were males. All the entheses appeared normal (homogenous fibrillar pattern) on grey-scale imaging. Mean tendon measurements are reported in Table 1. In group 1, Doppler signal was seen in: supraspinatus (intra-cartilage) in one patient; common extensor (intra-enthesal) in 2 patients and triceps (intra-cartilage) in 1 patient. In group 2, common extensor (intra-cartilage) in 2 patients and common flexor in 2 patients (intra-cartilage) showed PD. None of the patients in group 3 exhibit PD signal. Children did not show either potential lesions on entheses or joint synovitis at shoulders or elbows. The ICC for enthesal measurement demonstrated high concordance 0.92 (0.84-0.93).

Abstract THU0544 – Table 1. Entheses measurement

Entheses	Group 1	Group 2	Group 3
Supraspinatus m (SD)	2.3 (0.56)	2.9 (0.35)	3.4 (0.75)
Common flexor m (SD)	2.2 (0.83)	2.44 (0.86)	2.57 (0.54)
Common extensor m (SD)	1.96 (0.6)	2.3 (0.66)	2.72 (0.48)
Triceps m (SD)	2.7 (0.89)	3.1 (0.56)	3.5 (1.2)

Abbreviations: m: mean SD: standard deviation

Conclusion: Tendon echogenicity was similar in all ages. Entheses thickness has a linear relationship with age. Detection of entheses Doppler signals at the bone/cartilage interface is rare, but its detection in the insertion to unossified cartilage may be taking account as a physiological finding in upper healthy limbs in younger children.

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THU0545 A PROSPECTIVE OUTCOME OF ALL 17 CONSECUTIVE PEDIATRIC PATIENTS WITH CHRONIC NONBACTERIAL OSTEOMYELITIS TREATED WITH INTRAVENOUS PAMIDRONATE AND FOLLOWED AT A SINGLE CENTER OVER 15 YEARS

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Background: Intravenous pamidronate (IV-PAM) has been reported to be effective in pediatric patients with severe chronic nonbacterial osteomyelitis