Saint Petersburg, Russian Federation; ²Pediatric Research and Clinical Center for Infection Diseases, Saint-Petersburg, Russia, Prevention of Infectious Diseases and Immunodeficiency States, Saint Petersburg, Russian Federation; ³Pediatric Research and Clinical Center for Infection Diseases, Saint-Petersburg, Russia, Department of Virology and Molecular Biological Research Methods, Saint Petersburg, Russian Federation; ⁴Pediatric Research and Clinical Center for Infection Diseases, Saint-Petersburg, Russia, Prevention of Infectious Diseases and Immunodeficiency States, Saint Petersburg, Russian Federation; ⁵Saint Petersburg State Pediatric Medical University, Hospital Pediatrics, Saint-Petersburg, Russian Federation; ⁶Almazov National Medical Research Centre, Autoimmune and Autoinflammatory Diseases, Saint-Petersburg, Russian Federation

Background: Immunosuppressive drugs, decreased vaccine coverage, aberrant immunity might be factors of low anti-vaccine antibodies in JIA patients.

Objectives: The study aimed to evaluate risk factors of non-protective levels of antibodies against measles, mumps, rubella, hepatitis B and diphtheria in JIA patients.

Methods: A prospective study included 170 children diagnosed with JIA aged 2 to 17 years, who received routine vaccinations against measles, rubella, mumps, diphtheria and hepatitis B. In all patients, the levels of post-vaccination antibodies (IgG) for measles, rubella, mumps, hepatitis B and diphtheria measured with ELISA.

Results: Protective level of antibodies were 50% against hepatitis B, 52% diphtheria, 58% measles, 80% mumps, 98% rubella. The best coverage for MMR had patients with enthesitis-related arthritis 85%, compare to oligoarthritis 70%, polyarthritis 69%, systemic arthritis 63%. Diphtheria coverage was 50%, 51%, 46%, 63%, respectively. Incomplete MMR vaccination had 39% patients, treated with biologics, 22% with methotrexate and 14% with NSAID ($p=0.025$), and 61%, 46%, 36% for diphtheria ($p=0.021$). Incomplete vaccination was a risk factor of non-protective level of antibodies against measles (HR=2.03[95%CI: 1.02; 4.0], $p=0.042$), parotitis (HR=6.25[95%CI: 2.13; 17.9], $p=0.0008$) and diphtheria (HR=2.39[95%CI: 1.18; 4.85], $p=0.016$) vaccines. The lowest probability of having a protective level of antibodies was observed in systemic arthritis compared to oligoarthritis ($p=0.008$) and polyarthritis ($p=0.005$). JIA patients, with non-protective levels of antibodies against measles, had more extended methotrexate treatment (2.8 [1.3; 6.4] vs 2.2 [0.9; 3.9] years, $p<0.05$) and increased applying of the biologics (76% vs 52%, $p<0.05$). Patients treated with biologics had the lowest probability of having protective levels of antibodies against measles, mumps, hepatitis B, and diphtheria than MTX and NSAID. Patients with non-protective antibodies had lower vaccine coverage against mumps (56% vs 67%, $p<0.05$) and diphtheria (38% vs 61%, $p<0.01$), longer duration of methotrexate 3.3 [1.4; 6.7] vs 1.8 [1.0; 2.9] years, $p<0.01$ and biologic treatment 3.1 [1.1; 5.4] vs 0.9 [0.0; 1.9] years, $p<0.05$) compare to patients with protective levels. The main risk factors to have non-protective levels of antibodies against specific vaccines are in Table 1 below.

Conclusion: Children with JIA may have lower anti-vaccine antibodies levels and required routine check, especially in children with incomplete vaccination, biologics, systemic arthritis and long-term methotrexate treatment. Funding statement:

Footnotes: CI confidence interval, GCS glucocorticosteroids, HR hazard ratio, MTX methotrexate, na not applicable, soJIA systemic onset of juvenile idiopathic arthritis.

* Data were not calculated due to a small number of patients with a non-protective level of antibodies against rubella and no patients with incomplete vaccination against hepatitis

This work was supported by the Russian Foundation for Basic Research (grant № 18-515-57001).

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.503

POS1294

EFFECT OF EMOTIONAL TRIGGERS ON THE FREQUENCY OF PFAPA ATTACKS - A MULTICENTER STUDY

Y. Levinsky^{1,2}, Y. Butbul³, M. Gafner², M. Broide², S. Kagan², R. Tal¹, M. Natur⁴, K. Kaidar⁴, N. Dagan⁴, G. Amarilio^{4,5}, L. Harel^{1,5}. ¹Tel Aviv University, Sackler Faculty of Medicine, Tel Aviv, Israel; ²Schneider Children's Medical Center of Israel, Pediatrics, Petach Tikva, Israel; ³Technion - Israel Institute of Technology, Haifa, Israel, Pediatric Rheumatology Service, Ruth Rappaport Children's Hospital, Rambam Health Care Campus, Haifa, Israel, Haifa, Israel; ⁴Tel Aviv University, Sackler Faculty of Medicine, Tel Aviv, Israel; ⁵Schneider Children's Medical Center of Israel, Pediatric Rheumatology Clinic, Petach Tikva, Israel

Background: The fact that mental state may serve as a trigger for attacks of periodic fever diseases is known in Familial Mediterranean fever (FMF). There is a lack of information regarding the role of emotional triggers for PFAPA attacks.

Objectives: To examine whether emotional distress may trigger PFAPA attacks.

Methods: Enrolled were patients with active PFAPA, from two Israeli medical centers. Researchers contacted their parents by phone in two occasions: a. within the two weeks of returning to school after the first COVID-19 lockdown; b. during the summer vacation (i.e., non-stressful period). Parents were asked regarding the occurrence of PFAPA attacks within the two weeks preceding the calls. The relative stress levels of the two periods were validated by an emotional distress scale questionnaire. Differences between occurrences of attacks during these two periods of time were recorded.

Results: One-hundred and six pediatric patients enrolled in the study. Mean age was 7.37 ± 2.9 . In the stressful period, 41 (38.7%) reported at least one attack during the preceding 2 weeks, compared to 24 (22.6%) in the non-stressful period ($p = 0.017$). Scores for the mean emotional distress questionnaire were higher in the stressful period compared to the non-stressful period (35.6 ± 8.1 vs. 32.1 ± 7.7 , respectively, $P = 0.047$).

Conclusion: This study shows that during a period of stress for children there were more PFAPA attacks compared to a relaxed period. These findings indicate that mental factors such as stress or excitement may be triggers for PFAPA attacks.

Table 1. Attacks status during prior 2 weeks during stressful or non-stressful event

Outcome	First call (May 2020)	Second call (August 2020)	P-value
Pediatric emotional distress score (PEDS), mean ($\pm$ SD)	35.6 ($\pm$ 8.1)	32.1 ($\pm$ 7.7)	0.047
Any attacks during last 2 week, n (%)	41 (39.8%)	24 (24.2%)	0.017
Number of attacks			0.04
One, n (%)	27 (25.5%)	19 (17.9%)	
Two, n (%)	14 (13.2%)	5 (4.7%)	

REFERENCES:

- [1] Marshall GS, Edwards KM, Butler J, Lawton AR. Syndrome of periodic fever, pharyngitis, and aphthous stomatitis. *J Pediatr*. 1987;110(1):43-46. doi:10.1016/S0022-3476(87)80285-8
- [2] Feder HM, Salazar JC. A clinical review of 105 patients with PFAPA (a periodic fever syndrome). *Acta Paediatr Int J Paediatr*. 2010;99(2):178-184. doi:10.1111/j.1651-2227.2009.01554.x
- [3] Hall, J, Lindorff A. Children's Transition to School: Relationships Between Preschool Attendance, Cortisol Patterns, and Effortful Control. *The Educational and Developmental Psychologist*. *Educ Dev Psychol*. 2017;34(1):1-18
- [4] Stokes SJ, Saylor CF, Swenson CC, Daugherty TK. A comparison of children's behaviors following three types of stressors. *Child Psychiatry Hum Dev*. 1995;26(2):113-123. doi:10.1007/BF02353235
- [5] Førsvoll J, Kristoffersen EK, Øymar K. The immunology of the periodic fever, aphthous stomatitis, pharyngitis and cervical adenitis syndrome; what

Table 1.

Parameters	Measles		Parotitis		Rubella		Diphtheria		Hepatitis B	
	HR (95%CI)	p	HR (95%CI)	p	HR (95%CI)	p	HR (95%CI)	p	HR (95%CI)	P
soJIA, yes	1.84 (0.84; 4.03)	0.128	1.43 (0.53; 3.95)	0.492	0.99 (0.05; 18.6)	0.995	2.04 (0.91; 4.59)	0.08	2.52 (1.27; 5.0)	0.008
GCS, yes	1.54 (0.91; 2.61)	0.104	0.31 (0.45; 1.84)	0.799	0.736 (0.11; 4.88)	0.736	1.89 (1.1; 3.24)	0.02	1.34 (0.77; 2.32)	0.295
MTX, yes	0.86 (0.39; 1.88)	0.703	1.55 (0.49; 4.88)	0.453	1.53 (0.08; 28.64)	0.776	2.02 (0.71; 5.76)	0.187	0.6 (0.31; 1.15)	0.122
Biologics, yes	2.02 (1.22; 3.32)	0.006	1.76 (0.98; 3.15)	0.057	2.26 (0.5; 9.87)	0.293	1.67 (0.99; 2.8)	0.053	1.2 (0.75; 1.92)	0.453
>1 biologics, consequent, yes	1.57 (1.13; 2.2)	0.007	1.4 (0.93; 2.09)	0.104	1.82 (0.71; 4.7)	0.213	1.4 (0.98; 2.0)	0.062	1.11 (0.78; 1.58)	0.572
Incomplete vaccination, yes	2.02 (1.02; 4.0)	0.042	6.25 (2.13; 17.9)	0.00008	na	na	2.39 (1.18; 4.85)	0.016	na	na

can the tonsils reveal. A literature review. *Int J Pediatr Otorhinolaryngol*. 2020;130. doi:10.1016/j.ijporl.2019.109795

- [6] Gidron Y, Berkovitch M, Press J. Psychosocial correlates of incidence of attacks in children with Familial Mediterranean Fever. *J Behav Med*. 2003;26(2):95-104. doi:10.1023/A:1023038504481
- [7] Makay B, Emiroğlu N, Ünsal E. Depression and anxiety in children and adolescents with familial Mediterranean fever. *Clin Rheumatol*. 2010;29(4):375-379. doi:10.1007/s10067-009-1330-9
- [8] Kraszewska-Glomba B, Matkowska-Kocjan A, Szenborn L. The Pathogenesis of Periodic Fever, Aphthous Stomatitis, Pharyngitis, and Cervical Adenitis Syndrome: A Review of Current Research. *Mediators Inflamm*. 2015;2015:563876. doi:10.1155/2015/563876

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.706

POS1295

PERFORMANCE OF 2019 EULAR/ACR CLASSIFICATION CRITERIA FOR SYSTEMIC LUPUS ERYTHEMATOSUS IN A PEDIATRIC POPULATION – A MULTICENTER STUDY

Y. Levinsky^{1,2}, M. Broide¹, S. Kagan¹, O. Goldberg¹, O. Scheuerman¹, R. Tal³, I. Tirosh⁴, Y. Butbul⁵, L. Harel^{2,3}, G. Amarilio^{2,3}. ¹Schneider Children's Medical Center of Israel, Pediatrics, Petach Tikva, Israel; ²Tel Aviv University, Tel Aviv, Israel; ³Sackler Faculty of Medicine, Tel Aviv, Israel; ⁴Schneider Children's Medical Center of Israel, Pediatric Rheumatology Unit, Petach Tikva, Israel; ⁵Sheba Medical Center, Tel Hashomer, Pediatric Rheumatology Service, Edmond and Lily Safra Children's Hospital, Ramat Gan, Israel; ⁶Rambam Health Care Campus, Haifa, Israel, Pediatric Rheumatology Service, Ruth Rappaport Children's Hospital, Haifa, Israel

Background: The "European League Against Rheumatism" and "American College of Rheumatology" 2019 (EULAR/ACR-19) criteria for the diagnosis of Systemic Lupus Erythematosus (SLE) were recently published, with the stated goal of maintaining the level of sensitivity and raising the level of specificity for classification of SLE in adults.

Objectives: We aimed to examine the function of the new EULAR/ACR-19 criteria in a population of children and compare them to the SLICC-12 and ACR-97 criteria.

Methods: In this multicenter study the charts of jSLE patients from three tertiary medical centers were reviewed and compared to patients with non-jSLE diagnosis. Pediatric rheumatologists, blinded to the original diagnosis, reviewed and diagnosed all cases. Pediatric patients' clinical and laboratory data were retrospectively extracted and then examined with regard to how they met the new and old criteria.

Results: Included were 225 patients (112 jSLE, 113 non-SLE). When applied to juvenile SLE classification, the sensitivity of the new EULAR/ACR-19 criteria was 0.96 (0.9–0.99) and the specificity was 0.89 (0.82–0.94). These were comparable to the Systemic Lupus International Collaborating Clinics (SLICC) criteria. The sensitivity of the EULAR/ACR-19 criteria improves over time and was 0.83 twelve months following disease onset, reaching 0.96 after longer than 24 months.

Conclusion: Among a cohort of jSLE patients, sensitivity of the new EULAR/ACR-19 criteria was found to be high and specificity may have improved slightly compared to the SLICC-12 criteria. We support the use of the new classification criteria for pediatric patients in future jSLE studies, but it should be noted that its specificity is lower than for adults.

	ACR-97	SLICC-12	EULAR/ACR-19
Sensitivity (95% CI)	0.79 (0.70-0.86)	0.96 (0.9-0.99)	0.96 (0.9-0.99)
Specificity (95% CI)	0.94 (0.88-0.97)	0.85 (0.77-0.91)	0.89 (0.82-0.94)
Accuracy (95% CI)	0.86 (0.81-0.9)	0.9 (0.86-0.94)	0.92 (0.88-0.96)
Positive Likelihood Ratio (95% CI)	12.7(6.1-26.2)	6.35(4.1-9.9)	9.0 (5.3-15.4)
Negative Likelihood Ratio (95% CI)	0.23(0.16-0.33)	0.05(0.02-0.12)	0.05(0.02-0.12)
Diagnostic odds ratio (95% CI)	55.5(22.80-135.0)	120.85(43.0-340.0)	180.1(61.3-529.4)

REFERENCES:

- [1] Smith EMD, Lythgoe H, Midgley A, Beresford MW, Hedrich CM. Juvenile-onset systemic lupus erythematosus: Update on clinical presentation, pathophysiology and treatment options. *Clin Immunol* 2019 published on December 2019. doi: 10.1016/j.clim.2019.108274
- [2] Massias JS, Smith EMD, Al-Abadi E, Armon K, Bailey K, Ciurtin C, et al. Clinical and laboratory characteristics in juvenile-onset systemic lupus erythematosus across age groups. *Lupus* 2020;29(5):474–81.

- [3] Hochberg MC. Updating the American College of Rheumatology revised criteria for the classification of systemic lupus erythematosus. *Arthritis Rheum*. 1997 Sep;40(9):1725
- [4] Petri M, Orbai AM, Alarcón GS, Gordon C, Merrill JT, Fortin PR, et al. Derivation and validation of the systemic lupus international collaborating clinics classification criteria for systemic lupus erythematosus. *Arthritis Rheum* 2012 Aug;64(8):2677-86
- [5] Hartman EAR, van Royen-Kerkhof A, Jacobs JWJ, Welsing PMJ, Fritsch-Stork RDE. Performance of the 2012 Systemic Lupus International Collaborating Clinics classification criteria versus the 1997 American College of Rheumatology classification criteria in adult and juvenile systemic lupus erythematosus. A systematic review and meta-an. *Autoimmun Rev*. 2018;17(3):316–22.
- [6] Aringer M, Costenbader K, Daikh D, Brinks R, Mosca M, Ramsey-Goldman R, et al. 2019 European League Against Rheumatism/American College of Rheumatology Classification Criteria for Systemic Lupus Erythematosus. *Arthritis Rheumatol* 2019;71(9):1400–12.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.708

POS1296

JIA PATIENTS DO NOT HAVE MORE OSTEOPOROSIS THAN HEALTHY AGE AND SEX-MATCHED CONTROLS BUT LOWER BONE MASS DENSITY IS FOUND AT TOTAL HIP AND CORTICAL COMPARTMENT

M. Lopez Corbeto¹, M. Barcelo Bru², E. Moreno Ruzafa¹, M. Pasqual Pastor².

¹Vall d'Hebron University Hospital, Pediatric Rheumatology, Barcelona, Spain;

²Vall d'Hebron University Hospital, Rheumatology, Barcelona, Spain

Background: Achievement of a normal peak bone mass is an especially important consideration in young adults with juvenile idiopathic arthritis (JIA), because interference with attainment of peak bone mass may not be repaired later in life. It has been suggested that children with JIA cortical appendicular skeletal bone is more affected by disease activity than axial trabecular bone. To evaluate bone mineral density (BMD) DXA measurements are widely used. Although, DXA is limited to two-dimensional evaluation of integral BMD and cannot differentiate between trabecular and cortical bone compartments. Alternatively, 3D-DXA analysis is a new method based on DXA scans of proximal femur that provides accurate estimates of trabecular and cortical volumetric BMD.

Objectives: The aim of the study was to analyze the trabecular and cortical bone using 3D-DXA in young adults with JIA compared to age-matched healthy controls.

Methods: This cross-sectional study was aimed to analyze the differences in 3D-DXA proximal femur compartments. The patients were recruited from the specialized transitional unit of the Vall d'Hebron University Hospital. JIA patients older than 18 yo without previous bisphosphonates intake were included. Age and sex-matched healthy controls were selected. DXA scans (Lunar Prodigy, General Electric Medical Systems, v.15) were acquired. OP was defined according to the WHO criteria. The 3D-DXA software was used to assess in 3D the trabecular density and cortical thickness from DXA scans as reported previously