

M. E., Krivoschapkin V. G. Lipidny'j profil' i dislipoproteinemii u koren'nogo sel'skogo naseleniya Yakutii [Lipid profile and dyslipoproteinemia in the indigenous rural population of Yakutia]. *Sibirskij medicinskij zhurnal [Siberian Medical Journal (Tomsk)]*. 2012; 27 (3): 142-146 (In Russ.).]

5. Khamnagadayev I.I., Polikarpov L.S., Gankin M.I. et al. Pitaniye koren'nogo sel'skogo naseleniya Severa [Nutrition of the indigenous rural population of the North]. *Terapevticheskij arxiv [Therapeutic archive]*. 2003; 75 (1): 34-37 (In Russ.).]

6. Olesova L.D., Krivoschapkina Z.N., Semenova E.I. et al. Vliyanie pitaniya na lipidny'j obmen naseleniya arkticheskogo rajona Yakutii [The influence of nutrition on lipid metabolism of the population of the Arctic region of Yakutia]. *Voprosy' pitaniya [Nutrition issues]*. 2015; 84 (S3): 144 (In Russ.).]

7. Capurso C, Bellanti F, Lo Buglio A, et al. The Mediterranean Diet Slows Down the Progression of Aging and Helps to Prevent the Onset of Frailty: A Narrative Review. *Nutrients*. 2020;12:35.

8. Colman R.J., Anderson R.M., Johnson S.C., et al. Caloric restriction delays disease onset and mortality in rhesus monkeys *Science*, 325 (2009), pp. 201-204.

9. Gensous N, Garagnani P, Santoro A, et al. One-year Mediterranean diet promotes epigenetic rejuvenation with country- and sex-specific effects: a pilot study from the NU-AGE project. *Geroscience*. 2020;42: 687–701.

10. Gensous N, Franceschi C, Santoro A, et al. The Impact of Caloric Restriction on the Epigenetic Signatures of Aging. *Int J Mol Sci* 2019 Apr 24;20(8):2022.

11. Hannum G, Guinney J, Zhao L, et al. Genome-wide methylation profiles reveal quantitative views of human aging rates. *Mol Cell*. 2013; 49(2): 359–67.

12. Horvath S. DNA methylation age of human tissues and cell types. *Genome Biol*. 2013; 14(10): 115.

13. Horvath S, Pirazzini C, Bacalini MG, et al. Decreased epigenetic age of PBMCs from Italian semi-supercentenarians and their offspring. *Aging (Albany NY)*. 2015; 7:1159–70.

14. Jaul E, Barron J. Age-related diseases and clinical and public health implications for the 85 years old and over population. *Front Public Health*. 2017; 5: 335.

15. Kalyakulina A., Yusipov I., Kondakova E, et al. Epigenetics of the far northern Yakutian population. *Clin Epigenet* 15, 189 (2023).

16. Kim C.H., Lee E.K., Choi Y.J., et al. Short-term calorie restriction ameliorates genomewide, age-related alterations in DNA methylation. *Aging Cell*, 15 (2016), pp. 1074-1081.

17. Larry A Tucker Milk fat intake and telomere length in U.S. women and men: the role of the milk fat fraction. *Oxid. Med. Cell. Longev*. 2019 Oct 28; 2019:1574021.

18. Levy SB, Klimova TM, Zakharova RN, et al. Brown adipose tissue, energy expenditure, and biomarkers of cardio-metabolic health among the Yakut (Sakha) of northeastern Siberia. *Am J Hum Biol*. 2018. Vol. 30(6).

19. Lu AT, Quach A, Wilson JG, et al. DNA methylation GrimAge strongly predicts lifespan and healthspan. *Aging (Albany NY)*. 2019; Vol. 11(2): P. 303–27.

20. Quach A, Levine ME, Tanaka T, et al. Epigenetic clock analysis of diet, exercise, education, and lifestyle factors. *Aging*. 2017; Vol. 9(2). P. 419–46.

21. Varun B. Dwaraka, Lucia Aronica, Natalia Carreras-Gallo, et al. Unveiling the epigenetic impact of vegan vs. omnivorous diets on aging: insights from the Twins Nutrition Study (TwINS) *BMC Medicine* volume 22, Article number: 301 (2024).

CLINICAL CASE

DOI 10.25789/YMJ.2025.90.31

UDC 616.72-002-053.6

SAVVINA Maya Semyonovna – Ph.D., senior staff scientist of the laboratory of pediatric health level monitoring, Yakutsk science center of complex medical problems, maya_savvina@mail.ru; **ARGUNOVA Vera Maichna** – rheumatologist of the Department of cardiorheumatology, M.E. Nikolaev Pediatric center, Republican hospital No.1, senior non-staff rheumatologist of the Far-Eastern federal district. cardiorevmatologsakha@mail.ru; **SLEPTSOVA Polina Andreevna** – PhD, head of the Department of Cardiorheumatology M.E. Nikolaev Pediatric center, Republican hospital No.1, cardiorevmatologsakha@mail.ru; **AFONSKAYA Marina Viktorovna** – rheumatologist of the Department of Cardiorheumatology M.E. Nikolaev Pediatric center, Republican hospital No.1, senior non-staff rheumatologist of the Republic of Sakha (Yakutia); **YADREEVA Olga Valerievna** – haematologist of the Department of Oncohaematology M.E. Nikolaev Pediatric center, Republican hospital No.1; **KONDRATIEVA Sargylana Afanasyevna** – haematologist and oncologist of the department of oncohaematology M.E. Nikolaev Pediatric center, Republican hospital No.1; **BURTSEVA Tatiana Egorovna** – MD, Professor of the Department of Pediatrics and Pediatric Surgery, Medical institute Ammosov NEFU, main scientific consultant of the Yakut Science Center of Complex Medical Problems, bourtsevat@yandex.ru; **MUNKHALOVA Yana Afanasyevna** – PhD, Associate Professor, head of the Department of Pediatrics and Pediatric Surgery, Medical institute of Ammosov North-Eastern Federal University; **KOSTIK Mikhail Mikhailovich** – MD, Professor of the Department of Hospital Pediatrics, Saint-Petersburg State Pediatric Medical University, kost-mikhail@yandex.ru; **SLOBODCHIKOVA Maya Pavlovna** – senior lecturer of the Department of Foreign Languages with the course of Latin languages, St. Petersburg State Pediatric Medical University. limelight@mail.ru

M.S. Savvina, V.M. Argunova, P.A. Sleptsov, M.V. Afonskaya, O.V. Yadreeva, S.A. Kondratieva, T.E. Burtseva, Ya.A. Munkhalova, M.M. Kostik, M.P. Slobodchikova

A CLINICAL CASE OF THE COMBINED ACUTE PROMYELOCYTIC LEUKEMIA AND JUVENILE IDIOPATHIC ARTHRITIS

A clinical case of enteritis-associated juvenile arthritis during the therapeutic stage of consolidation of acute promyelocytic leukemia is presented in the article. It describes the clinical case of a 16-year old teenager. Arthritis in a patient with leukemia is commonly associated either with an exacerbation of the underlying disease or with an infectious process in the joint or the adjacent bone. Leukemic arthritis is commonly manifested by monoarthritis, involving large joints and presented with severe night pain, lymphadenopathy, and hepatosplenomegaly. Joint pain reduction is a sign of a clinical response to chemotherapy.

Musculoskeletal system involvement caused by infection is represented by local inflammatory process accompanied with fever, local hyperemia, hyperthermia, inflammatory changes in blood test results and requires a course of intensive antibacterial therapy with the temporary cessation of chemotherapy. The development of juvenile idiopathic arthritis during leukemia therapy caused diagnostic and therapeutic difficulties due to uncommonly rare association of the both diseases, which required the exclusion of leukemia recurrence and an infectious complication. NSAID therapy brought temporary relief, janus kinase blocker (upadacitinib therapy) was ineffective, only subsequent switching to etanercept allowed the remission of arthritis. Leukemia treatment was carried out in conjunction with JIA treatment.

Keywords: acute promyelocytic leukemia (APL), juvenile idiopathic arthritis, leukemia chemotherapy, myelogram, children and adolescents.

For citation: A clinical case of the combined acute promyelocytic leukemia and juvenile idiopathic arthritis. M.S. Savvina, V.M. Argunova, P.A. Sleptsova, M.V. Afonskaya, T.E. Burtseva, Ya.A. Munkhalova, M.M. Kostik, M.P. Slobodchikova. *Yakut Medical Journal*. 2025; 90(2): 127-130. <https://doi.org/10.25789/YMJ.2025.90.31>

Introduction. Acute promyelocytic leukemia results from the variant of a gene, caused by abnormal overgrowth of promyelocytes. Acute promyelocytic

leukemia occurs in 5-10% of all cases of acute myeloid leukemia [3,8]. It is severe disease characterized by expressed skin and mucosal hemorrhage syndrome [7,18].

In a case of acute promyelocytic leukemia alpha is abnormal, which encodes nuclear hormone transcription factor and is present in the long arm of chromosome 17, participating in APL [9,19,21]. It promotes to expression of the several genes after binding to retinoic acid. In most cases (90%) APL is associated with t translocation (15;17) (q22;q21), which results in fusion of promyelocytic leukemia gene to RAR-alpha to generate 2 genes. These translocations are also clinically significant because of their sensitivity or partial/complete refractoriness to retinoids [4,9,12].

The incidence of APL is increasing with age. It occurs in 3-4% of all cases at the age of 0-17. APL is almost uncommon for children under 10 years of age. Clinically the APL patients develop weakness, fatigue, frequent nose bleed, gum bleeding and high fever. Early manifestations of leukemia are similar to rheumatic signs and symptoms. Moreover, it is known that arthritis is common manifestation of leukemia in children [8,11].

A clinical case. A 16-year patient N., Sakha by origin, was admitted to the department of oncohaematology of M.E. Nikolaev Republican hospital #1 of the Republic of Sakha (Yakutia) to receive the second course of ATRA supportive therapy. It is evident from the anamnesis, that the child started complaining of dizziness, weakness, in a few days there was a high fever up to 39.0 C; asthenia, flaccidity, dizziness and lack of appe-



MR imaging of the cervical spine (T2 protocol): synovitis in cholesteatoma (arrow).

tite were new symptoms. The results of full blood count revealed: leukocytes – $2.6 \times 10^9/L$, lymphocytes – 69.4%, monocytes – 10.0%, granulocytes – 20.6%, erythrocytes – $2.2 \times 10^{12}/L$, hemoglobin – 63 g/L, platelets – $28 \times 10^9/L$, ESR – 69 mm/hr. The patient was admitted to the oncological department of M.E. Nikolaev Republican hospital #1 of the Republic of Sakha (Yakutia). The myelogram revealed hypercellular marrow with total metaplasia of the blast cells reaching up to 93%, with reduced normal immature blood cell production, according to morphological and cytochemical signs these blasts can be referred to the variant of AML M3. Immune phenotype of the blast cells can be morphologically referred to

M3 variant. MRI of the brain revealed the signs of small subdural hematoma in the distal part of the right parietal region and small subdural hygroma along the frontal and temporal areas of the both sides. Acute promyelocytic leukemia is diagnosed, classified as M3 variant at the period of progression. Subdural bleeding in the right temporal part is noticed. Subconjunctival hemorrhage in the right side and retinal hemorrhage of the both eyes were determined. Coagulopathy is revealed.

The treatment was performed according to APL treatment protocol (by 2008) remission induction (lasted 2.5 months), consolidation (6 days), intensive therapy (3 days).

The consolidation phase was accompanied with pains in the neck, high temperature (up to 38.8 C) and pains in the right knee joint. The local examination of the right knee joint showed that it was bigger in size, swollen and painful there was increased temperature above the joint. The laboratory findings revealed elevated CRP 189 mg/L (norm: 0-5 mg/L). The full blood count showed: erythrocytes – $3.1 \times 10^{12}/L$, leukocytes – $4.9 \times 10^9/L$, platelets – $254 \times 10^9/L$, hemoglobin – 86 g/L, monocytosis – 18%, blasts – 2%, myelocytes – 12%, metamyelocytes – 4%, polymorphnuclear leukocytes (neutrophils) -33%, elevated ESR up to 70 mm/hr.

The myelogram on a 4-graded score on the 91 day of the disease revealed that bone marrow was characterized by increased cellularity and polymorphism. The blast cells were: 1.6%; 1.6%; 1.0%; 1.6%.

Biochemical blood test results on the 94th day were: elevated ALT – 41.5 Un/L (norm <37 Un/L), AST – 39 Un/L (norm

The indices of the biochemical blood test results and full blood count

	On admission	On the 7th day	On the 15th day	RR (reference range)
Erythrocytes	4.25	4.18	4.34	$3.93-5.29 \times 10^{12}/L$
Leukocytes	2.26	3.03	2.96	$3.84-9.84 \times 10^{12}/L$
Hemoglobin	135.0	132.0	135.0	108-145g/L
Platelets	168.0	167.0	171.0	$175.0-345.0 \times 10^9/L$
Polymorphnuclear leukocytes (neutrophils)	44.0	64.0	50.0	47.0-72.0%
Lymphocytes	43.0	22.0	37.0	19.0-37.0%
Monocytes	8.0	7.0	5.0	3.0-11.0%
ESR by Panchenkov	4.00	2.00	2.00	1.0-10.0mm/hr
Albumin	37.30	41.50	42.40	35.00-52.00g/L
Protein total	60.50	60.80	62.90	64.00-80.00g/L
Urea	3.40	2.80	2.50	2.50-6.40mmol/L
ALT	54.60	78.10	247.10	0,00-27,00 ед/л
AST	25.40	23.10	60.70	0,00-29,00 ед/л
Creatinine	57.80	58.40	67.10	62,00-115,00 ммоль/л

<29Un/L), ferritin – 992 mg/L (RI: 15-204 mg/L).

Coagulogram results on the 94th day of the disease were: PT 84% (RR – reference range: 95-105%); PT 12.5 sec. (RR: 11-18 sec); INR (international normalized ratio (MHO)) – 1.1; aPTT (activated partial thromboplastin time) – 35.9 sec (reference range: 25-50 sec.); fibrinogen – 10.2 g/L (reference range: 1.25 – 4 g/L). HLA antigen – B27 is positive.

Digital radiography of the knee joints was carried out in 2 projections and revealed indirect X-ray signs of arthritis in the right knee joint. MRI of the knee joint showed synovitis. MR imaging of the cervical spine showed fluid in the cholesteatoma (figure). MR imaging of the lumbar and sacral spine revealed infiltration of the muscles in L4-L5.

After rheumatologist consultation the data of the radiological methods of investigation were changed, juvenile idiopathic arthritis, B-27 associated HLA, oligoarticular variant of the III-rd degree of activity was diagnosed, grade 2 is established according to radiological findings. Upadacitinib therapy was administered. As the upadacitinib therapy was ineffective it was changed into etanercept which showed positive dynamic.

Both after leukemia intensification and arthritis therapy the patient received supportive therapy of APL.

By the second stage of therapy with all-trans retinoic acid (ATRA) the patient objectively had severe condition caused by the main disease. The patient was active although no significant changes in the general condition were noticed. The skin was pale and clean. The osteoarticular system had no visible defects.

Laboratory findings are represented in the table.

Antibiotics therapy, chemotherapy and etanercept are administered.

The leukemia treatment finished. There were no data of recurrence. The child is discharged from the hospital to be followed up by the local pediatrician.

Discussion. We represented a complicated clinical case of the rare combination of juvenile idiopathic arthritis debut in a teenager which occurred during leukemia treatment. The musculoskeletal manifestations in the patients with oncological and hematologic malignancies can be of various nature, most commonly pains in the bones and the joints can be associated with bone marrow infiltration caused by the blast cells. Transient synovites were associated with the blast cells producing proinflammatory cytokines [11]. The articular syndrome can also be associated with hyperuricemia resulting from

massive blast cell breakdown. The musculoskeletal complaints of those patients who are receiving chemotherapy should exclude recurrence of hematological disorders, septic arthritis, hematogenous osteomyelitis, avascular necrosis, osteoporosis including pathological stress fractures [21]. It is noted that arthritis can be a complication of leukemia [11,16]. Leukemic arthritis is frequent in children. 60% of the pediatric patients with leukemia complain of pains of the musculoskeletal system, arthritis is diagnosed only in 5% of them [11,20]. Joint pain complains can be initial manifestation of leukemia and it should be born in mind when diagnosing. Juvenile idiopathic arthritis (JIA) is most common kind of chronic rheumatic disorders in children under 16 [2]. There are several kinds of manifestations, B27 HLA associated juvenile arthritis is the most common in the Republic of Sakha (Yakutia). It is defined that B27 HLA antigen is present in all subtypes of JIA in children of indigenous population of the Republic of Sakha (Yakutia) [1]. The symptoms of JIA in that case started during the consolidation period, which was carried out according to APL protocol by 2008. It was determined that arthritis did not recur in combination with leukemia, moreover septic arthritis and hematogenous osteomyelitis were excluded as possible infectious complications of chemotherapy.

Chronic arthritis in leukemia patients is commonly rare. Although blood disorders and rheumatic diseases are associated with immune system dysfunction; the course of cancer therapy, as a rule, is stronger and targeted and is unable to control arthritis. Combined therapy is required in such patients which includes the drugs of different class and enables to control both hematological and rheumatic diseases. Immunoinflammatory manifestations are described in patients with APL on ATRA therapy as ATRA-syndrome, which is characterized by high fever without confirmed infection, fluid retention resulting in edematous syndrome with increase of body mass, acute respiratory distress with pulmonary infiltrates, bloody expectoration and development of respiratory failure, pleuritis and pericarditis, arterial hypotension, acute renal failure (acute kidney injury) [13]. The syndrome is based on inflammatory cytokines production and development of capillary leak syndrome. The same changes are noticed in rheumatic patients with syndrome of macrophage activation, multisystemic inflammatory syndrome, DRESS-syndrome [10,14]. Some singular arthritis cases are described in the patients on ATRA therapy [5]. It should be noted that

ATRA itself has anti-inflammatory effect against arthritis; it was confirmed clinically in rats by suppressing Th17-related pathway and change of the gut microbiota composition [6].

The cases of sacroiliitis and spondyloarthritis which occur as a result of retinoid (isotretinoin) therapy for dermatological conditions are well known. Thus, 149 articles are found by the key words "Isotretinoin-induced arthritis" searching in the PubMed and almost all of them describe the adult patients [15]. A most profound investigation of 513 adult patients on isotretinoin therapy showed that 24% of them complained of pains in the lower part of the spinal column, 17.1% were diagnosed with arthralgia, Achilles tendon enthesopathy was determined in 2 patients. 42.3% were diagnosed with sacroiliitis, which was confirmed by MRI, 10.1% of all the group developed pain in the lower portion of the spinal column. Among PRI-confirmed sacroiliitis 51.9% corresponded to ASAS classification criteria for ankylosing spondyloarthritis. MRI of the sacro-iliac joints showed normalization within 9 months in all the patients after retinoid therapy cessation [17].

Conclusion. Chronic arthritis associated with leukemia is uncommon in children, especially when it occurs during chemotherapy. The musculoskeletal symptoms occurrence requires a wide range of differential diagnosis and choice of therapy taking into account both diseases and safety profile. The case demonstrates not only difficulties in juvenile arthritis diagnosis but also possible development of arthritis induced by retinoid therapy.

The authors declare no conflict of interest in the submitted article.

References

1. Kostik M.M., Isupova E.A., Shilova E.A., Avrusin I.S., et al. Differentsial'naya diagnostika yuvenil'nogo artrita s sistemnym debyutom i «revmaticheskikh masok» onkogematologicheskikh zabolevaniy [Differential diagnosis of systemic-onset juvenile arthritis and rheumatic masks of oncohematological diseases: a retrospective cohort study]. Voprosy sovremennoy pediatrii [Issues of Modern Pediatrics. 2017; 16(3): 220 – 225. (In Russ.).] DOI: 10.15690/3.1732
2. Boeskorova S.G., Afonskaya M.V., Argunova V.M., et al. Kliniko-epidemiologicheskaya harakteristika yuvenil'nogo idiopatcheskogo artrita u detej v Respublike Saha (Yakutiya) [Clinical and epidemiological characteristics of juvenile idiopathic arthritis in children of the Republic of Sakha (Yakutia)]. Pediatria [Pediatrics. 2024; 103(5): 28-37. (In Russ.).] <https://www.elibrary.ru/item.asp?id=73160032>
3. Samochatova E.V., et al. Effektivnost' terapii ostrogo promielocitarnogo lejkoza u detej s ispol'zovaniem polnost'yu transretinovevoj kisloty, citozin-arabinozida i snizhennyh doz antraciklin-

ov [Samochatova E.V., et al. Efficiency of acute promyelocytic leukemia treatment with all-trans-retinoic acid cytosine arabinoside and reduced anthracycline doses]. *Onkogematologiya* [Oncohematology. 2008;3:8-17 (In Russ.).] DOI: 10.17650/1818-8346-2020-0-3-8-17

4. Chen X., et al. A novel NPM1-RARG-NPM1 chimeric fusion in acute myeloid leukaemia resembling acute promyelocytic leukaemia but resistant to all-trans retinoic acid and arsenic trioxide. *Br. J. Cancer*. 2019; 120(11): 1023-1025. DOI: 10.1038/s41416-019-0456-z.

5. Akoz A.G., Engin H., Oztoprak N. Atypical presentation of retinoic acid syndrome that mimics septic arthritis in a patient with acute promyelocytic leukemia. *Acta Oncol*. 2007; 46(8):1193-1194. doi:10.1080/02841860701348688

6. Zhang, Y., Luo, Y., Shi, J., et al. All-trans retinoic acid alleviates collagen-induced arthritis and promotes intestinal homeostasis. *Sci Rep* 14, 1811 (2024). <https://doi.org/10.1038/s41598-024-52322-x>

7. Ammatuna E., Huls G. Multidimensional radar dot-plots, do we need it for the screening of acute promyelocytic leukemia? *Ann. Hematol*. 2019; 98(7): 1793-1794. DOI: 10.1007/s00277-019-03693-z.

8. Childhood Acute Myeloid Leukemia Treatment (PDQ): Health Professional Version. PDQ Pediatric Treatment Editorial Board. PDQ Cancer Information Summaries [Internet]. National Cancer Institute (US); Bethesda (MD). 6. 2025. PMID: 26389454.

9. Cingam S.R., Koshy N.V. Acute Promy-

elocytic Leukemia. 2023. Jan.26. In: StatPearls [Internet]. Treasure Island: StatPearls Publishing; 2025 Jan. PMID: 29083825.

10. Avrusin I.S., Bregel L.V., Efremova O.S., et al. Development of preliminary criteria of macrophage activation syndrome in multisystem inflammatory syndrome associated with COVID-19 in children. *Biomedicine*. 2024;12(12):2868. doi:10.3390/biomedicine12122868.

11. Alfonso R., et al. Differences between leukemic arthritis and juvenile idiopathic arthritis. *Pediatric Rheumatology*. 2023; 21(50). DOI: 10.1186/s12969-023-00836-5.

12. Huang Q., Zhang Y., Zheng M. Clinical analysis of 82 cases of acute promyelocytic leukemia with PML-RARα short isoform in children and adults. *J. Front Oncol*. 2024; 21(14). DOI: 10.3389/fonc.2024.1342671.

13. Gasparovic L., Weiler S., Higi L., et al. Incidence of Differentiation Syndrome Associated with Treatment Regimens in Acute Myeloid Leukemia: A Systematic Review of the Literature. *J Clin Med*. 2020;9(10):3342. doi:10.3390/jcm9103342

14. Saper V.E., Tian L., Verstegen R.H.J. et al. Interleukin (IL)-1/IL-6-Inhibitor-Associated Drug Reaction With Eosinophilia and Systemic Symptoms (DReSS) in Systemic Inflammatory Illnesses. *J Allergy Clin Immunol Pract*. 2024;12(11):2996-3013.e7. doi:10.1016/j.jaip.2024.07.002

15. Yilmaz Tasdelen O., Yurdakul F.G., et al. Isotretinoin-induced arthritis mimicking both rheumatoid arthritis and axial spondyloar-

thritis. *Int J Rheum Dis*. 2015;18(4):466-469. doi:10.1111/1756-185X.12464

16. Zhang X., et al. MLL-rearrangement can resemble acute promyelocytic leukemia. *Leuk Lymphoma*. 2019; 60(11). 2841-2843. DOI: 10.1080/10428194.2019.1607328.

17. Elnady B., Elkhoully T., Dawoud N.M. New onset of axial spondyloarthritis in patients treated with isotretinoin for acne vulgaris: incidence, follow-up, and MRI findings. *Clin Rheumatol*. 2022; 41(8):2615. doi: 10.1007/s10067-022-06178-z

18. Rajani P.Y., et al. Outcomes in adult acute promyelocytic leukemia: a decade experience. *J. CLML*. 2020; 20(4):158-164. DOI: 10.1016.2019.12.011.

19. Louvigné M., et al. Persistent osteoarticular pain in children: early clinical and laboratory findings suggestive of acute lymphoblastic leukemia (a multicenter case-control study of 147 patients). *Pediatr Rheumatol Online J*. 2020;18(1):1. doi: <https://doi.org/10.1186/s12969-019-0376-8>.

20. Yan W., et al. RNF8 is responsible for ATRA resistance in variant acute promyelocytic leukemia with GTF21/RARA fusion, and inhibition of the ubiquitin-proteasome pathway contributes to the reversion of ATRA resistance. *Cancer Cell Int*. 2019; 19: 84. DOI: 10.1186/s12935-019-0803-4.

21. Fonseca M.B., et al. Signs and symptoms of rheumatic diseases as first manifestation of pediatric cancer: diagnosis and prognosis implications. *J. Rev. Bras. Reumatol*. 2017; 57:330. 7. doi: 10.1016/j.jbre.2017.01.007.

Z.P. Androsova, Yu.N. Nikolaev, V.B. Egorova, T.E. Burtseva, Ya.A. Munkhalova, I.N. Rozhina

POST-COVID ACUTE DISSEMINATED MENINGOENCEPHALITIS IN A 2-YEAR-OLD CHILD: A CLINICAL CASE

DOI 10.25789/YMJ.2025.90.32

UDC 616.9:579.845

Psychoneurological Department No. 2, Pediatric Center, Republican Hospital No. 1 – M. Nikolaev National Medical Center: **ANDROSOVA Zinaida Petrovna** – MD, neurologist, Azp07@mail.ru; **NIKOLAEV Yuri Nikolaevich** – neurologist, head of department, yunick@yandex.ru; Medical Institute, M.K. Ammosov North-Eastern Federal University: **EGOROVA Vera Borisovna** – MD, associate professor of the Department of Pediatrics and Pediatric Surgery, ORCID 0000-00003-3051-5251, veraborisovna@yandex.ru; **MUNKHALOVA Yana Afanasyevna** – MD, head of the Department of Pediatrics and Pediatric Surgery, ORCID 0000-0002-9657-5612, tokmacheva@mail.ru; **ROZHINA Irina Nikolaevna** – 2nd-year resident in Pediatrics (specialty 31.08.19), Department of Pediatrics and Pediatric Surgery, irinarozina38@gmail.com, **BURTSEVA Tatyana Egorovna** – MD, associate professor, professor of the Department of Pediatrics and Pediatric Surgery, Medical Institute, M.K. Ammosov North-Eastern Federal University, leading researcher of the Yakut Science Center of Complex Medical Problems, ORCID 0000-0002-5490-2072, bourtsevat@yandex.ru.

Among all published studies, it has been noted that in COVID-19, in addition to respiratory system dysfunction, one-third of patients (30–35%) exhibit signs of nervous system (NS) involvement. Descriptions of various neurological diseases complicating the course of coronavirus infection (COVID-19) or representing its unique clinical manifestation are available. One of the neurological complications of COVID-19 is meningoencephalitis.

This article examines the clinical presentation, diagnosis, and treatment of acute disseminated meningoencephalitis (ADME) that developed in a child following COVID-19. Special attention is given to the pathogenesis of the disease, which is associated with the body's immune response to the SARS-CoV-2 virus, leading to inflammatory processes in the central nervous system. Data from instrumental and laboratory diagnostics, as well as treatment, are presented. The importance of early detection and comprehensive treatment to prevent severe neurological complications and improve prognosis in young patients is emphasized.

Keywords: COVID-19, meningoencephalitis, central nervous system disease, neurological complications

For citation: Z.P. Androsova, Yu.N. Nikolaev, V.B. Egorova, T.E. Burtseva, Ya.A. Munkhalova, I.N. Rozhina. Post-COVID acute disseminated meningoencephalitis in a 2-year-old child: a clinical case. *Yakut Medical Journal*. 2025; 90(2): 130-132. <https://doi.org/10.25789/YMJ.2025.90.32>

Introduction. Acute disseminated meningoencephalitis (ADME) is an inflammatory disease of the central ner-

vous system (CNS) characterized by damage to the brain's soft tissues and meninges, leading to various neurologi-