

have been subjected to the second administration of IVGG. However, 20% of affected children were still proved to have the coronary damage by echo-cardiography examination. The introduction of infliximab for KD children after the 1st IVGG improved the coronary involvement to 6%. We have recently developed the biomarker of KD, and according to the findings of the high titer we are trying the plasma exchange for these severe KD children to remove all kinds of inflammatory cytokines. Taken together, the excessive and variable inflammatory cytokines in disease-specific manner available in our trials indicated to be causative agents of each inflammatory disease progression.

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The ability of tocilizumab induces the remission in systemic juvenile idiopathic arthritis: the main predictors

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Background: Systemic juvenile idiopathic arthritis (SJIA) is one of the most striking forms of juvenile arthritis, required biologic administration due to failure of corticosteroids (CS) and DMARDs. Currently there are two strategies in treatment SJIA with biologic: blockade of IL-1 and IL-6. Despite similar efficacy and safety profile in latest ACR recommendations blockade of IL-6 recognized as second-line biologic treatment after using the anakinra. The question about first line biologic treatment in SJIA is still open.

Objectives: The aim of our study was to evaluate outcomes and find predictors of remission in SJIA children, receiving TCZ therapy.

Methods: Our retrospective study was included 48 active SJIA children who fall CS, methotrexate (MTX), cyclosporine A (CsA) and their combination in whom TCZ was initiated in dosage 12 mg/kg if weight was <30 kg and 8 mg/kg if weight ≥30 kg. The duration of study was limited the 1st and last TCZ infusions. We evaluated clinical and laboratorial signs, attributed to SJIA, such as presence of fever, hepatosplenomegaly, serositis, rash, lymphadenopathy, active joints, the levels of Hb, WBC, PLT, granulocytes, LDH, and macrophage activation syndrome (MAS). We check the granulocytes levels throw 1, 2 and 4 weeks after 1st TCZ infusion. The efficacy of TCZ was measured throw changes of SJIA attributed signs and symptoms and achievement the remission according to C. Wallace (2004) criteria.

Results: The main demographic parameters (Me; IQR) included the age-9.9 (5-12.7) years and delay of TCZ-27.0 (5.9-89.7) months. The treatment before TCZ included CS-38 (79.2%), MTX-40 (83.3%), CsA-18 (37.5%) and their combination. The macrophage activation syndrome (MAS) in past medical history before TCZ was in 14 (29.2%).

During the trial CS successfully discontinued 25 (65.8), CsA 8/18 (44.4%), MTX 12/40 (30.0%) patients. In 7 children TCZ was discontinued due to stable remission with median duration 640 days. After TCZ initiation 6 children have experienced MAS, but all of them had MAS before TCZ, so no "new cases" were observed on TCZ. 5 children early withdrew during the trial due to adverse events (infusion reaction, MAS) and 2 child died (1 severe uncontrolled MAS, 1 amyloidosis).

During the TCZ treatment 40 (83.3%) achieved the remission in 138.5 (56.0; 255.0) days. Patients, who achieved remission had milder disease course, presented in less frequent hepatosplenomegaly, lung, heart and CNS involvement, hemorrhagic syndrome and MAS. They had higher Hb (P = 0.02) and lower WBC (P = 0.048), granulocytes (P = 0.015), ESR (P = 0.034), CRP (P = 0.05), LDH (P = 0.0003), ferritin (P = 0.0007). The main predictors of achievement inactive disease, calculated with Cox-regression models, were CRP≤82.0 mg/l (OR=7.9, P = 0.016, HR=1.17, P = 0.66), ESR≤32 mm/h (OR=17.0, P = 0.014, HR=0.85, P = 0.62), ferritin≤273 ng/ml (OR=56.5, P = 0.0001, HR=2.6, P = 0.02), Hb>113 g/l (OR=17.0, P = 0.014, HR=1.33, P = 0.38), LDH≤676 U/l (OR=113.6, P = 0.000014, HR=3.2, P = 0.03), PLT>335*10⁹/l (OR=5.0, P = 0.11, HR=2.5, P = 0.007), and intensive depression of WBC in 2 weeks after 1st TCZ infusion>11% (OR=13.0, P = 0.03, HR=6.0, P = 0.02) and granulocytes>12% (OR=14.0, P = 0.05, HR=4.7, P = 0.13).

Conclusions: We found clinical and laboratorial criteria for SoJIA remission during the tocilizumab treatment.

Parameters	OR (95% CI)	P	HR	P
CRP≤82.0 mg/l**	7,9 (1,4-45,3)	0,016*	1,17	0,66
ESR≤32 mm/h**	17,0 (0,9-314,3)	0,014*	0,85	0,62
Ferritin≤273 ng/ml**	56,5 (2,8-1124,9)	0,0001*	2,6	0,02
Hb>11.3 g/dl*	17,0 (0,9-314,3)	0,014*	1,33	0,38
LDH≤676 U/l**	113,6 (5,3-2451,8)	0,000014*	3,18	0,029
PLT>335*10 ⁹ /l**	5,0 (0,9-28,9)	0,11*	2,54	0,007
Age of 1st TCZ infusion≤11y.**	2,6 (0,6-12,4)	0,24*	1,44	0,3
Decreased WBC in 2 weeks>11%**	13,0 (1,4-124,3)	0,03*	6,03	0,019
Decreased Granulocytes in 2 weeks>12%**	14,0(1,1-185,5)	0,05*	4,7	0,13
MAS before TCZ	0,17 (0,04-0,87)	0,037*	0,7	0,34

Me (IQR), * Fisher's exact test, ** AUC – area under the curve.

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Opportunities of cone-beam computed tomography application in rheumatology

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In compliance with EULAR recommendations standard radiography (SR) should be used at the first stage of diagnostics of distal upper and lower limbs changes in RD (A. N. Colebatch et al., 2013). Unfortunately it has not always allows assessment of bone structure changes (A. Savnik et al., 2012). When characteristic features are absent ultrasound and / or magnetic resonance imaging (MRI) should be implemented (C. Wiell et al., 2008). Its advantages in diagnosis of inflammatory and destructive joints changes in such patients are covered in detail in numerous publications (M. A. McQueen et al., 2014, L. M. Stone et al., 2015). Radiology diagnostics in particular severity assessment of upper and lower limb joints damage is still limited mostly by SR in everyday clinical practice. According to some authors opinion multislice computed tomography (MSCT) is the most informative for characteristic radiologic features identification, but its application is restricted by many factors including relatively high radiation exposure (L. Barozzi et al., 2014).

Nowadays, it became possible to use high-tech technique of cone-beam computed tomography (CBCT) for distal upper and lower limbs examinations, including rheumatologic practice. (D. Makarova, K. Kushnir et al., 2015, 2016).

Aims and objectives: The aim of the research was to assess application opportunities of upper and lower distal limbs CBCT in patients with RD.

Materials and methods: The results of 248 CBCT studies of the upper and lower limbs distal segments were analyzed to determine the severity of articular syndrome in patients (n = 124) at the age from 34 to 65 with rheumatic diseases in anamnesis. CBCT was carried out using a cone-beam computed unit (NewTom 5G, QR s. r. l., Italy). It has the following technical characteristics: 200 × 250 mm flat-panel detector size, 180 × 160 mm maximum field of view, and a 360 ° gantry rotation around the region of interest. The CBCT examinations were performed in special-purpose positioning setups allowing full coverage of the region of interest. The obtained data were compared with the SR and MSCT results. In addition calculations of direct costs of different ray methods of the hand, wrist, ankle and foot examinations have been analyzed.

Results: CBCT images post-processing allowed identifying the characteristic signs of rheumatic joints' lesions of distal segments of upper and lower limbs: osteoporosis, cystoid body transformation, irregular joints spaces narrowing, bony ankylosis, articular surfaces erosions and osteolysis areas, bone deformities, subluxations and dislocations. Wide range of CBCT images mathematical processing reveals an opportunity to assess pathological remodeling areas of bone structure and to determine its precise spatial location. In addition, CBCT images were distinguished by high spatial resolution, optimal signal-to-noise ratio, uniform accuracy and dynamic range grayscale, which allowed estimating not only of bone structure, but dense soft tissue formations as well: diffuse periarticular thickening and density increasing. During comparative analysis of the obtained information it was found that CBCT was highly competitive with MSCT and, at the same time, was superior to SR in the characteristic features visualization in 74% of cases in patients from the observation group. It also should be noted that due to multiplanar reconstructions it became possible to identify and evaluate cystic cavities, erosions, enthesophytes and osteolysis areas even when its size does not exceed 1 mm. Such small changes were not visualized reliably with SR.

Conclusion: Taking into account low radiation dose in comparison with MSCT, high spatial resolution with the ability to identify even less than 1 mm bone structural remodeling, and relatively low direct cost of the study, CBCT could be considered as a first stage method for the characteristic changes diagnosis of the upper and lower distal limbs bones and joints in patients with RD. Additionally, this technique could be used in dynamics, while monitoring the therapy effectiveness, replacing gradually SR.

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Opportunities of cone-beam computed tomography in hand and wrist joints changes assessment in patients with psoriatic arthritis

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One of the most severe forms of psoriasis which significantly decreases the patients' life quality is the joints damage – psoriatic arthritis (PsA) and it varies from 5 to 47 % among all the cases of skin and joints simultaneous lesions [1]. PsA is an independent nosological form of chronic inflammatory lesions of joints that develops in patients with psoriasis [2].

Nowadays high-tech technique of cone-beam computed tomography (CBCT) is gradually adapting to diagnostic algorithm for musculoskeletal system structural changes assessment. The most important advantage of CBCT is a low exposure dose (~0.035 μSv per examination) [3, 4].

There are only few publications on applicability of CBCT in patients with rheumatic diseases in actual literature. Some of them are devoted to CBCT in PsA diagnostics [4, 5].

Aims and objectives: Aims and objectives were to assess the opportunities of CBCT in detection of specific PsA changes.

Methods and materials: The results of standard radiography (SR) and CBCT (n = 56) examinations of hands and wrists aged from 24 to 59 with PsA in anamnesis have been analyzed.