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## MONITORING OF THE TREATMENT EFFECT OF THE SECONDARY MYOPATHY SYNDROME IN PATIENTS WITH JUVENILE RHEUMATOID ARTHRITIS

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### Abstract

The syndrome of the secondary myopathy is one of the pathologies that is deeply spreaded in doctor's practice and has a tendency to be increased being 30 – 60% of all chronicle pain syndromes in rheumatology practice. We provided examination of 43 patients with JRA to monitor effect of the treatment. The data presents that development of the secondary myopathy syndrome in patients with JRA is characterized with severe clinical currency of the disease, high inflammatory activity and significant influence on the quality of patient's life so needed to be treated specific.

**Key words: secondary myopathy, juvenile rheumatoid arthritis.**

For present period of time main goal of the pediatric and rheumatology practices is to decrease intensity of the inflammatory and immune links of the pathogenesis of the juvenile rheumatoid arthritis (JRA), stop development of the dangerous systemic signs of the disease, prevent development destructive changes in the joints and achieve clinical and laboratory remission.

But even though well known basic treatment of the JRA really acts in front of pathogenic failures, influence of it on the muscle elements is very poor in aspect of the treatment its functional incompliance. According to the last data clinical signs of the muscle injury syndrome as secondary myopathy, significantly influence quality of life of the patients with JRA almost destroying it. So to improve condition of the muscle component of the disease we developed complex of the isometric limited physical exercises (ILPE) that in their intense didn't come over 75% of the maximum allowed according to every exact case.

That is why the goal of the study was to monitor effect of the complex treatment of the JRA in its main influence on the manifestation of secondary myopathy syndrome.

### Materials and methods

We passed clinical and laboratory-instrumental control under 43 patients with JRA and signs of secondary myopathy that received treatment as basic therapy and ILPE. The average age of the patients was 12 (7,5;15) years. The duration of the disease was 28 (10;39) months. According to the presence of the ILPE in treatment course kids were divided on 2 groups. The first group was presented by 21 (29,17±3,11) % kids that except basic treatment (BT) received ILPE. The second group was presented by 22 (30,56±3,06) % kids that received just basic treatment of the JRA. The average dose of the metothrexate was 7,5 up to 15 mg/m<sup>2</sup>/week according the activity of the process, in 2,5 mg every 12 hours. As well kids received folic acid in dosage – 5mg/week together with basic therapy kids got disease modifying treatment that included nonsteroid anti-inflammatory drugs and glucocorticoids in short courses. In case of poor effect of the anti inflammatory treatment kids where prescribed to receive local treatment with intraarticular input of glucocorticoids, usually 3,5 - 7 mg/input (0,5 – 1 ml). Both groups were representative according to age and sex parameters as well according to the duration of the process.

Estimation of the effect of the basic treatment of JRA was carried out according to ARA criteria, stage of the functional insufficiency due to results of questionnaires CHAQ, SF-36. As well we checked direct signs of the inflammatory response activity - concentration of the IL-1 $\beta$ , IL-6 and NF-kB, markers of the muscle tissue damage – kreatinkinase-MM, electroneuromyography, interferential electromyography. Dynamic control under the patients was occurred 24 weeks, with control check-ins on 4, 12 and 24 weeks after the complex treatment start.

### **Results and their discussion**

So in one month of the treatment positive dynamic in main clinical signs as muscle pain, was occurred in patients of the both groups, but in different levels. So, patients of the first group got decreased frequency of the regular muscle pain on 72,16±4,49 %, that was in 2,3 times more the results of the patients that didn't get ILPE. Decreasing of the muscle sickness and tiredness - on 56,5±4,65 and 60,0±4,5 % was over the results of the second group results. We found that pain intensity in 100-mm score was decreased just in first group of the patients (on 19,23±2,69 %). The same tendency was carried out in algometry Ocher's score. So in group of the patients that got ILPE in 4 weeks mainly were I and II stages intensity of the pain (66,6±2,6) % and 14,28±2,46 % of kids got total its absence. In the second group of the patients positive tendency was described as well but quantity of the children with III and IV stages of the pain was on 30,56±2,68 % higher the results of the first group.

In both groups we saw positive dynamic of the inflammatory markers, but the most significant was decreasing concentration of the kreatinkinase-MM, specially in kids with ILPE (on  $34,32 \pm 2,74$  %) to compare with results before the treatment, and with second group - on  $13,2 \pm 2,11$  %. In the second group of the patients significant decreasing of the kreatinkinase concentration was on  $23,9 \pm 2,16$  % with previous results.

Results of the 12 weeks monitoring after the beginning of the therapy in both groups were more meaning full as in clinical, as well in laboratory data. So in

4 ( $19,05 \pm 2,24$ ) % kids of the first group we got ACR 50, in 10 ( $47,62 \pm 2,57$ ) % – ACR 30. In the second group of the patients 2 ( $9,1 \pm 1,74$ ) % patients achieved ACR 50 and 11 ( $50,0 \pm 2,5$ ) % – ACR 30. More represent we found results of the muscle syndrome treatment in patients with JRA. In the first group of the patients in 1 ( $4,76 \pm 1,08$ ) % kid we got stable pain in muscles, in 7 ( $33,3 \pm 2,79$ ) % periodical. Such result significantly covered data of the second group that had regular muscle pain in 5 ( $22,73 \pm 2,35$ ) % cases and 8 ( $36,3 \pm 2,44$ ) % - periodical. Muscle sickness and tiredness we observed in 3 ( $14,3 \pm 1,87$ ) % patients of the first group and 5 ( $22,7 \pm 1,96$ ) % - of the second.

So kids of both groups had sow decreasing of the C-reactive protein concentration and IL-1 $\beta$ , as well amount of the IL-6 and NF-kB was stable, that can be due to the period of basic treatment. In kids of the first group amount of the C-reactive protein decreased on  $17,1 \pm 1,38$  %, in the second – on  $12,5 \pm 1,29$  % to compare with results before the treatment. Concentration of the IL-1 $\beta$  was decreased on  $11,8 \pm 1,16$  % in the first group and on  $9,46 \pm 1,03$  % in the second. Concentration of the kreatinkinase-MM was mainly decreased in group of the patients with ILPE – on  $38,45 \pm 2,83$  %, in the second – on  $32,25 \pm 2,47$  %.

About functional characteristic of the muscle system – the kids of the first group had normal results of the interferential myography up to reference meanings of the healthy children.

In 24 weeks of the complex treatment in 1 ( $4,76 \pm 1,13$ ) % kid of the first group was ACR 70, in 6 ( $28,57 \pm 2,36$ ) % - ACR 50, in 9 ( $42,86 \pm 2,84$ ) % - ACR 30. In the second group of the patients ACR 70 was in 1 ( $4,54 \pm 1,09$ ) % patient, in 5 ( $22,73 \pm 2,27$ ) % - ACR 50, in 10 ( $45,45 \pm 2,86$ ) % - ACR 30. Intensity of the muscle pain and stableness were observed in 3 ( $13,64 \pm 2,16$ ) % patients of the second group. Periodical character of the pain syndrome was mainly in the second group of the patients - 6 ( $27,3 \pm 2,54$ ) % and 2 ( $9,52 \pm 1,88$ ) % - in the first group.

According to the results of the Ocher's score absence of the pain syndrome was in 7 ( $33,3 \pm 2,17$ ) % patients of the first group and in 3 ( $13,6 \pm 1,88$ ) % of the second one. I stage of

the severity was in 8 (38,1±2,22) % and 6 (27,3±2,19) % of the patients of the first and second groups. II stage was found in 6 (28,57±2,2) % and 10 (45,45±2,46) % patients of the first and second groups. III stage was observed just in 3 (13,6±2,06) % patients of the second group.

Dynamic of the main laboratory signs of the inflammatory response demonstrated significant decreasing all of them in 24 weeks. We found that in 24 weeks of the monitoring was decreased amount of the IL-6 – on 11,9±1,21 and 11,7±1,19 % in first and second groups. Amount of the NF-kB was decreased on – 16,7±1,29 and 14,1±1,27 % in both groups. Concentration of the kreatinkinase-MM in first group was on 12,5±1,86 % better than result of the second group and was - 53,4 (48,6; 59,8) and 60,9 (56,4; 70,3) P/l in both.

Results of the interferential electromyography in patients of the first group wasn't significant different with the results of the healthy children. Amplitude and frequency of the constructions were on 17,55±1,31 and 9,11±1,03 % lower the results of the healthy children. But while the marker amplitude/frequency became normal we can prove positive dynamic but a little slower than in patients of the first group.

### **Conclusion**

1. In patients with JRA and signs of secondary myopathy that in treatment scheme received basic treatment and ILPE for 4 weeks was possible to achieve decreasing of the intensity of the muscle pain syndrome with stable character of the myalgias (on 72,17±4,49) %, change of the character of the pain and muscle tiredness (in 4,7 times), sickness (on 60,0±4,5) %, that significantly influenced general condition of the children and followed changes of the algometry and improving of the quality of life (on 14,3±1,65) % - SF-36.

2. 12 – weeks monitoring of the effect of the complex treatment of JRA proved its better results while prescribing ILPE due to achieved results of the total muscle function normalization.

3. Using of the ILPE in complex treatment of the secondary myopathy in patients with JRA allowed increase functional condition of the muscles while influence on the intensity of the pain syndrome and as well improving quality of life of the kids.

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