

Study of the ratio of the concentrations of methotrexate (MTX) metabolites in the red blood cells of patients with rheumatoid arthritis (RA)



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Biography

Galina Gridneva has extensive clinical and research experience in the rheumatology. PhD since 2016. Specializes in the personification of disease modifying antirheumatic therapy. Validated the methodology for calculating the dose of methotrexate on the body surface area of patients with rheumatoid arthritis, which is used at V.A. Nasonova Research Institute of Rheumatology and recommended for use in medical institutions in Russia. Her current research interests are the optimization of methotrexate therapy for patients with rheumatoid arthritis.



Abstract

Statement of the Problem: The concentration of MTX polyglutamates (MTPXG) in red blood cells may become an objective therapy response predictor. Objective is to study the correlation between the level of MTPXG in patients taking methotrexate in stable doses, on the therapeutic response.

Methodology & Theoretical Orientation: The study included 60 (44 women and 16 men) adult (>18 years old) RA patients according to ACR/EULAR 2010 criteria. Group 1 (n=30) had good therapeutic effect on MTX therapy according to the EULAR criteria of the treatment effectiveness. Group 2 (n = 30) had moderate or no effect. MTPXG (total and MTPXG 1,2,3,4,5) were determined in erythrocytes by tandem mass spectrometry. The therapy was: MTX subcutaneously at least 20 mg/week, for 12-225 weeks before including.

Results: The weekly dose of MTX was comparable in all patients. It was established that the levels of total MTPG and MTPG1,2,3,5 in erythrocytes did not correlate with the effectiveness of MTX. At the same time, the level of MTPXG4 was significantly higher ($p = 0.023$) in patients of group 1 (26.4 ± 6.1 nmol/l) compared with patients in group 2 (22.1 ± 6.8 nmol/l). ROC-analyses showed that MTPG4 values below 22.5 nmol/l matched to the absence of the therapeutic effect of MT. The area under the curve was 0.672, (CI 95 0.536-0.808); $p=0.022$. Specificity-53.3%, sensitivity - 77%.

Conclusion: The target level of MTPXG4 in erythrocytes to achieve a good therapeutic response is 22.5 nmol / L or more.

Publications

Issues of optimization of methotrexate therapy in patients with rheumatoid arthritis

Safety issues of infliximab in treatment of rheumatoid arthritis

Therapeutic drug monitoring of methotrexate and its metabolites in the red blood cells and mononuclear cells of patients with rheumatoid arthritis

The use of subcutaneous methotrexate from various manufacturers in real clinical practice: a comparative study