

SUMMARY

RHEOHEMAPHERESIS - Clinical Importance of Rheological, Technical and Further Hemapheretic Indicators of Effectivity, Side-effects and Economy

INTRODUCTION: (Haema)rheopheresis combines the possibilities of haemapheresis (a therapeutic method that is focused on the separation of blood components) and medical rheology (a field of science studying blood fluidity and applying the results of this research to clinical practice in pathological impairments, mainly in the area of microcirculation). The rationale of the effect of rheopheresis (RF): the procedures simultaneously eliminate the exactly defined spectrum of rheologically relevant high-molecular proteins. An immediate pulse reduction of plasma viscosity and viscosity of full blood occurs, which can lead to subsequent permanent "recovery" of the microcirculation with the use of a series of procedures and significantly change the natural course of chronic therapy. RF has been tested in several diseases. This study involves the use of rheopheresis in the dry form of age-related macular degeneration (AMD) and sudden idiopathic sensorineural hearing loss - SISHL. The research was aimed at the optimisation of own modification of rheopheresis, effectivity of procedures, search for the markers of immediate efficacy and prognosis, evaluation of safety and economic aspects of rheopheresis.

METHODS: Rheopheresis was therapeutically used in 112 patients. 71 of them had AMD (41 females and 30 males at mean age of 67.0 years) and 41 patients had SISHL (14 females and 27 males at mean age of 56.0 years). A continual separator (Cobe Spectra or Spectra Optia, Terumo BCT, USA) was used for separation of plasma. The secondary filter (EvafluxA, Japan) was placed and controlled by the CF 100 device (Infomed, Switzerland). Rheopheresis was performed in patients with AMD in a series of 8 procedures (2 procedures in one week, with a subsequent pause of 14 days); 3 procedures in SISHL (2 procedures, pause 2-3 days of 6 to 9day period).

RESULTS: We performed and evaluated 748 rheophereses in: *a)* 626 procedures in *patients with AMD* (551 procedures within the basic planned cycle and 75 additional procedures). The planned cycle of therapy (8 rheophereses during 10 weeks) was finished in 67 patients (94.3 %). There were 3.8 % of side-effects (none of them were severe according to CTACAE v.4.03/2009). Therapy was clinically effective in 52 patients (78.8 %) and worsening of AMD occurred in 14 patients (21.2 %), 1 patient had no follow-up. *b)* 122 rheophereses were performed in *41 patients with SISHL*. The planned therapy was completed in 39 patients (95.1 %). Even following failure of standard therapy with corticoids, an improvement of hearing occurred in 26 patients (66.7 %) and failure of therapy occurred in 13 (33.3 %) patients. Side-effects: 6.6 % (none of them was severe according to CTCAE v. 4.03/2009).

Results of the laboratory monitoring found effectiveness of RF – a statistically significant decrease of all rheological effective parameters was found ($p < 0,0001$). Prediction of success of therapy using basic rheologically significant parameters was not successful, but a discrimination analysis showed promising preliminary results during prediction of efficacy and prognosis.

CONCLUSION: The used own modification of rheopheresis is an effective and safe rescue possibility of affecting the destiny of patients with a dry form of AMD and SISHL. These data originate from the analysis of the study file that is one of the biggest published files of therapy with rheopheresis. The aims of the research were completely fulfilled and new knowledge out of the original plan was acquired – to develop and verify a programme of effective and long-term therapy of patients with AMD, using the adjuvant therapy programme (booster therapy), as well as to prepare a new programme of therapy of acute unilateral vestibulopathy with rheopheresis. A newly used method of discrimination analysis will make it possible to predefine prognosis and modify the intensity of therapy, if our preliminary test results are confirmed.