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PLASMAPHERESIS IN RHEUMATOID ARTHRITIS: CLINICAL OBSERVATIONS

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Abstract: Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by progressive joint damage and systemic complications. Despite the widespread use of conventional disease-modifying therapies and biological agents, some patients exhibit resistance or intolerance to medications. Extracorporeal methods, including therapeutic plasmapheresis, are gaining importance as an adjunctive measure to reduce autoimmune activity. The present study aims to evaluate the clinical effectiveness of plasmapheresis in patients with active RA.

Keywords: rheumatoid arthritis, plasmapheresis, extracorporeal therapy, immune complexes, DAS28, autoimmunity.

Introduction

Rheumatoid arthritis (RA) ranks among the leading autoimmune diseases of the musculoskeletal system, primarily affecting women of working age (Smolen et al., 2016). The disease is characterized by chronic inflammation of the synovial membrane, driven by activation of T cells, B cells, production of autoantibodies (rheumatoid factor, anti-CCP), and proinflammatory cytokines (TNF-α, IL-6, IL-1β) (McInnes & Schett, 2011).

Modern pharmacotherapy includes methotrexate, leflunomide, sulfasalazine, biological agents, and JAK inhibitors. However, up to 30% of patients fail to achieve sustained remission even with long-term treatment (Singh et al., 2016). Given the immune complex nature of RA and its systemic manifestations, plasmapheresis is considered a method for rapid reduction of autoantibodies, circulating immune complexes (CICs), and inflammatory mediators from the blood plasma (Umemoto et al., 2020).

Plasmapheresis has demonstrated effectiveness in treating systemic lupus erythematosus, vasculitis, Goodpasture syndrome, as well as complicated forms of RA (Zhou et al., 2019; Kuroda et al., 2014). However, clinical studies on its use in RA remain limited, particularly in CIS countries, which highlights the need for further research on this method.

Materials and Methods

A prospective single-center clinical observation was conducted involving 28 patients with a confirmed diagnosis of rheumatoid arthritis according to the 2010 ACR/EULAR criteria.

Inclusion criteria:

- DAS28 ≥ 4.2,
- Lack of adequate response to standard therapy for ≥6 months,
- No contraindications to extracorporeal methods.

Treatment protocol:

- 3 sessions of therapeutic plasmapheresis with 48-hour intervals.
- Centrifugal method, plasma volume removed — 800–1000 ml.
- Replacement fluids — isotonic solution, 5% albumin, partially fresh frozen plasma.

Effectiveness evaluation:

- Disease Activity Score (DAS28),
- C-reactive protein (CRP) level,
- Rheumatoid factor (RF),

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- Visual analog scale (VAS) for pain,
- Anti-CCP (in a subset of patients, n = 15).

Comparative analysis was conducted using published data and previous meta-analyses (Zhou et al., 2019; Yoshida et al., 2017).

Results

One week after completing the treatment course, 75% of patients showed a clinically significant reduction in disease activity (ΔDAS28 > 1.2). Mean DAS28 values decreased from 5.3 ± 0.6 to 3.8 ± 0.7 ($p < 0.01$).

CRP levels decreased from 28.4 ± 5.6 mg/L to 15.2 ± 4.1 mg/L on average (−46%).

RF decreased by more than 50% from baseline in 60% of patients.

VAS pain scores dropped from 6.8 ± 1.1 to 4.3 ± 1.0.

Anti-CCP levels decreased in 8 of 15 patients (average −22%), suggesting reduced autoimmune activity.

Adverse effects:

- Mild hypotension (11%),
- Dizziness, fatigue (7%),
- All adverse effects were reversible and did not require termination of the procedures.

Discussion

Our findings support the high short-term efficacy of plasmapheresis in patients with refractory RA. The removal of circulating immune complexes and proinflammatory cytokines leads to a reduction in systemic inflammation, in line with the findings of Kuroda et al. (2014), Yoshida et al. (2017), Zhou et al. (2019).

According to multicenter studies in Japan and Germany, plasmapheresis significantly increases sensitivity to subsequent therapy with biological agents (Wada et al., 2012).

However, the therapeutic effect is usually temporary (3–6 weeks), necessitating repeat courses or follow-up immunosuppression. The most effective approach is combining plasmapheresis with pharmacotherapy, especially during high disease activity (Singh et al., 2016).

Limitations of the method include its availability, cost, and the need for specialized equipment and trained personnel.

Conclusion

Plasmapheresis is an effective adjunct to standard therapy for rheumatoid arthritis in cases of high inflammatory activity and resistance to pharmacological treatment. Its application is associated with significant reductions in clinical and laboratory markers of disease activity, as well as improvements in patient well-being and quality of life.

Based on our findings, plasmapheresis can be recommended for inclusion in treatment algorithms for patients with severe RA in specialized centers. However, further randomized controlled trials are needed to assess its long-term effectiveness, optimal indications, and cost-effectiveness.

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