The Health Technology Report Series has been developed by the Institute of Family Medicine and Public Health at the University of Tartu.

Extracorporeal photopheresis

Summary

Objective: To evaluate the effectiveness, safety, cost-effectiveness and budget impact of extracorporeal photopheresis in comparison to the current alternative options in Estonia for the treatment of erythrodermic cutaneous T-cell lymphomas and steroidrefractory acute and chronic graft versus disease.

Methods: Extracorporeal photopheresis was compared to the alternative treatment options available in Estonia as of 2025 for the treatment of erythrodermic cutaneous T-cell lymphoma (methotrexate, gemcitabine, brentuximab, mogamulizumab) and acute (mycophenolate, infliximab, vedolizumab) and chronic (mycophenolate) GVHD in the second line of treatment after failure of first-line glucocorticoid therapy. A systematic review and meta-analysis of the evidence was performed. A large portion of trials examining extracorporeal photopheresis had to be excluded due to being used in combination with other treatments not available in Estonia.

Results: The pooled overall response rate in erythrodermic cutaneous T-cell lymphoma was similar in patients treated with extracorporeal photopheresis 53% (95% CI 0,40–0,66), methotrexate (61%, 95% CI 0,47–0,73), gemcitabine (61%, 95% CI 0,52–0,69), brentuximab (57%, 95% CI 0,40–0,72) and mogamulizumab (57%, 95% CI 0,39–0,74).

In acute GVHD the pooled overall response rate for extracorporeal photopheresis was also similar (72%, 95% CI 0,65–0,79) compared to mycophenolate (60%, 95% CI 0,44–0,74), infliximab (66%, 95% CI 0,57–0,74) and vedolizumab (62%, 95% CI 0,17–0,93). In chronic GVHD, the pooled overall response rate was also similar for extracorporeal photopheresis (67%, 95% CI 0,50–0,80) and mycophenolate (57%, 95% CI 0,38–0,74).

These results are in line with the conclusions made by the authors of international guidelines, by which the evidence available in insufficient to conclude whether one intervention is more effective in acheiving remission compared to others. Compared to the alternatives, extracorporeal photopheresis seems to be associated with a significantlyt favourable adverse effects profile.

The cost-effectiveness analysis was performed only for the treatment of acute and chronic GVHD as the point value of the overall response rate was lower for extracorporeal photopheresis than for the comparators. The ICER was calculated as 59 500€ and 89 300€ for the treatment of acute and chronic GVHD, respectively. Funding extracorporeal photopheresis for the treatment of acute or chronic GVHD in Estonia would result in an estimated incremental annual cost of 94 300€ and 432 600€ to the National Health Fund, respectively.

Conclusions: The quality of evidence of extracorporeal photopheresis in the treatment of erythrodermic cutaneous T-cell lymphoma and acute and chronic graft-versus-host disease remains poor, based mainly on single-centre uncontrolled observation studies. The current evidence suggests that there is no remarkable difference in achieving a treatment response in erythrodermic cutaneous lymphoma or in acute and chronic GVHD between extracorporeal photopheresis and currently available best treatments in Estonia. The ICER values of 59 500€ and 89 300€ exceed the implicit cost-effectiveness threshold. That being said, extracorporeal photopheresis has been investigated and shown positive results in other immune-mediated illnesses and various rheumatic diseases. While there is a lack of consensus on the role of extracorporeal photopheresis in the treatment of these diseases, it could represent a potential treatment for the patient who has not achieved remission with any other therapies. Further and higher quality research is needed to determine a more comprehensive spectrum of patients likely to benefit treatment with extracorporeal photopheresis.

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