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RETROSPECTIVE SINGLE-CENTER STUDY OF EXTRACORPOREAL PHOTOPHERESIS AS SECOND-LINE TREATMENT FOR CHRONIC GRAFT-VERSUS-HOST DISEASE

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BACKGROUND

Allogeneic hematopoietic stem cell transplantation (HSCT) is a cornerstone of treatment for hematological malignancies. **Chronic graft-versus-host disease (cGVHD)** remains a major cause of morbidity and mortality following HSCT. Many cGVHD patients require prolonged systemic immunosuppression with corticosteroids, which carry significant adverse effects, and second-line therapies are often required. **Extracorporeal photopheresis (ECP)** has shown promise as a second-line treatment, but recent data on efficacy is limited and has shown variable responses.

AIM

To evaluate the efficacy of ECP as a treatment for cGVHD patients in a real-world, contemporary cohort.

METHOD

We retrospectively analyzed 53 patients treated with ECP for cGVHD at our center from 2010 to 2024. Clinical endpoints included overall response rate (ORR), clinical benefit rate (CBR), failure-free survival (FFS), and overall survival (OS). Logistic regression was performed to assess risk factors on binary outcomes, and Kaplan-Meier method and Cox regression were used for time-to-event outcomes.

RESULTS

At ECP start: 31 (58.5%) patients had severe cGVHD, 44 (83.1%) had involvement of multiple organs, 37 (59.7%) were on steroids.

ORR was 51% in our cohort, with best response rates seen in GI (70.0%) and liver (69.2%), as well as skin (42.4%) and mouth (42.3%) [Fig. 1].

Clinical benefit, a composite outcome of ORR and steroid reduction, was **66%** of patients deriving at least some benefit from ECP treatment.

Estimated 1- and 3-year **FFS** was 75.5% (95% CI=61.5-84.9%) and 43.1% (95% CI=28.6-56.9%), respectively [Fig. 2A].

Estimated 1- and 3-year **OS** was 79.2% (95% CI=65.7-87.9%) and 70.1% (95% CI=55.0- 80.9%), respectively [Fig. 2B].

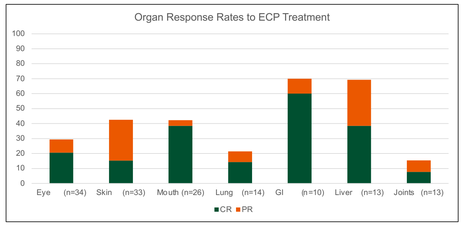


Figure 1. Organ response to ECP treatment.

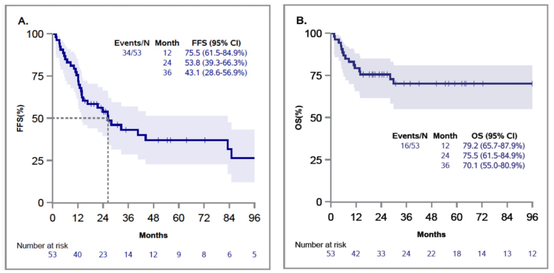


Figure 2. Kaplan-Meier curves for failure-free survival (FFS) (A) and overall survival (OS) (B).

Consistent with established risk factors, we found that patients treated with high-dose steroids, an increased number of cGVHD-involved organs, or severe grade cGVHD, have increased likelihood for worse outcomes [1].

Patients with ocular cGVHD appeared more likely to derive overall clinical benefit and less likely to fail treatment. While ocular involvement was the most common of any organ among patients in our cohort (34 patients, 64.2%), organ-specific ORR was only 29.4%. It is difficult to ascribe this finding to a specific physiology, although an ocular cGVHD-predominant phenotype cluster has been shown through machine learning risk group stratification to demonstrate favorable OS [2].

Patients on at least one IST were more likely to derive significant clinical benefit from ECP treatment. The use of tacrolimus at ECP start had lower risk of death and treatment-failure and patients were more likely to achieve a strong steroid-sparing effect.

While ECP is generally considered safe, with a lower risk of infection compared to alternative cGVHD treatments [76, 77], it is not completely without risks. One result that stands out in our data is that **complications requiring line removal or replacement** (e.g. infection, line obstruction, itching around the catheter site, or pulmonary embolism) **occurred in 32.1% of patients**, with a median time to first complication of 29.3 weeks. This result suggests that, especially in patients who continue ECP for a prolonged period, complications requiring management can be expected to arise.

CONCLUSIONS

Our study supports the growing body of literature that **ECP is a safe and effective treatment for cGVHD**, with impressive response rates and a steroid-sparing effect in an advanced and difficult-to-treat population.

Further prospective studies are important to identify the optimal utilization of ECP as a cGVHD treatment, especially with the development of novel targeted agents.

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