Extracorporeal Photopheresis (ECP): A Treatment for Some Patients with Graft-versus-Host Disease (GVHD)

Celebrating a Second Chance at Life Survivorship Symposium

April 27 – May 3, 2024
Learning Objectives

• Learn how ECP works
• Understand how ECP differs from other treatments for graft vs. host disease
• Identify who might benefit from ECP
Outline

• How graft vs. host disease develops
• Usual approach to graft vs. host disease treatment
• How ECP works
• Pros and Cons of ECP treatment
• Bone marrow = factory where blood cells are made

• Stem cell = single prototype that can develop into any kind of blood cells

• Donor’s stem cells have 2 jobs:
  1. **Manufacturing**: supply new stem cells (prototypes) to regrow a healthy marrow
  2. **Surveillance***: supply new immune cells to protect against cancer relapse

*For patients who get a transplant to treat cancer
The Transplanted Immune System

Graft-versus-Leukemia effect

transplanted immune cells

An abnormal cell!

cancer cell

host immune cell

transplanted (grafted) cells attack and kill cancer cells

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The Transplanted Immune System

Graft-versus-Host Disease

transplanted immune cells
transplanted (grafted) cells attack and kill host cells

host cells

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You’re not familiar!
Targets of Graft vs. Host Disease

Acute GVHD
Major Organ Involvement:
- Skin
- Intestine
- Liver

Chronic GVHD
Major Organ Involvement:
- Skin
- Intestine
- Liver
- Mouth
- Nails
- Hair
- Eye
- Lung
- Genitalia
- Musculoskeletal System
- Hematopoietic and Immune Systems
Graft vs. Host Disease Prevention & Treatment*

Prevention
- tacrolimus, sirolimus, methotrexate, post-transplant cyclophosphamide, mycophenolate mofetil, abatacept +more

First-line treatment
- corticosteroids (prednisone, methylprednisolone)

Second-line treatment
- acute GVHD: ruxolitinib
- chronic GVHD: ibrutinib, ruxolitinib, belumosudil

Later-line treatment
- ECP +more

Introduction to Extracorporeal Photopheresis (ECP)

Extracorporeal Photopheresis (ECP)
- extra = outside
- corporeal = the body
- photo = light
- pheresis = removing blood from the body, manipulating it, then returning it to the body

ECP = light therapy performed on blood cells which are removed from the body and then returned
Introduction to Extracorporeal Photopheresis (ECP)

- Patient is connected to an apheresis machine
- Blood is removed and blood cells are separated
- A light sensitizer is added (8-methoxypsoralen)
- Blood + sensitizer mixture is exposed to ultraviolet A light
- Treated blood cells are returned to the patient
How Extracorporeal Photopheresis Works

- Changes the levels of chemicals (cytokines) that affect inflammation
- Decreases levels of immune cells that contribute to GVHD
- Increases levels of “tolerant” immune cells
Is Extracorporeal Photopheresis Effective?

- Limitations of most published studies: small numbers of patients, variation in patient populations and ECP schedules, retrospective design

**Acute GVHD:**
- Reported response rates 60% and higher
- Best responses in patients with skin involvement, early initiation (15 vs. 21 days)

**Chronic GVHD:**
- Reported response rates more variable (30%-75%)
- Best responses in patients with skin, oral cavity, GI, and liver involvement

- Your care team can compare ECP to other therapies to predict what treatment has the best balance of risks and benefits
Extracorporeal Photopheresis: Logistics

Treatment Schedule
• Twice weekly, then weekly, then every 2 weeks

Typical appointment
• Vital signs, labs
• IV access
• Transfusions or electrolyte infusions if needed
• ECP procedure

Duration of treatment
• Months to years
Pros and Cons of Extracorporeal Photopheresis

Pros
• Low risk of infection
• Doesn’t decrease blood counts
• Can be added to other treatments
• Can be given in or out of the hospital

Cons
• May be inconvenient
• May require port placement
• Can take time to work
• May not be available at transplant center
Candidates for Extracorporeal Photopheresis

- Moderate to severe symptoms of graft vs. host disease
- Partial response or lack of response to steroids
- Appropriate IV access
- Laboratory criteria
- Availability at transplant center
Acknowledgments

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- Patients and caregivers
Questions?

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