2843. Maternal Fecal Transplantation to Infants Born by Cesarean Section: Safety and Feasibility

Otto Helve, MD, PhD[1]; Katri Korpela, PhD[2]; Kaija-Leena Kolho, MD, PhD[3]; Terhi Saisto, MD, PhD[4]; Kirsi Skogberg, MD, PhD[4]; Evgenia Dikareva, PhD[2]; Vedran Stefanovic, MD, PhD[5]; Anne Salonen, MD, PhD[2]; Willem M. de Vos, PhD[2] and Sture Andersson, MD, PhD[3]; [1]Children's Hospital, Pediatric Research Center, Helsinki University Hospital, University of Helsinki, Helsinki, Uusimaa, Finland; [2]Human Microbiome Research Program, Faculty of Medicine, University of Helsinki, Helsinki, Uusimaa, Finland; [3]Pediatric Research Center, Helsinki University Hospital, University of Helsinki, Helsinki, Uusimaa, Finland; [4]Helsinki University Hospital, Helsinki, Uusimaa, Finland; [5]Women's Clinic, Helsinki University Hospital and the University of Helsinki, Helsinki, Uusimaa, Finland

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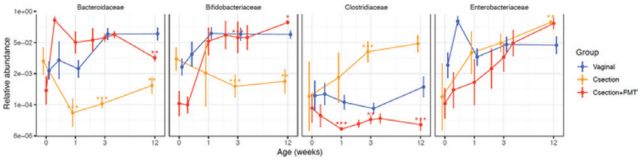
Background. A complication of cesarean section delivery is its interference with the normal intestinal colonization of the infant, affecting the development of immune system in early life—a process that has been associated with long-term morbidity, such as allergy and diabetes. We evaluated, in CS-delivered infants, whether the normal intestinal microbiome and its early life development could be restored by immediate postnatal transfer of maternal fecal microbiota to the newborn.

Methods. Seventeen healthy mothers with planned elective CS were recruited and screened thoroughly for infections, after which 7 mothers were included in the study. A fecal sample was processed according to a transplantation protocol and an aliquot (3–7 mg) was orally administered in breast-milk to the newborn during the first feeding. The infants were followed and fecal samples were gathered during the first 12 weeks of age and subsequently at the age of 8–18 months.

Results. The bacterial communities in the fecal samples of the mothers and their offspring were analyzed by sequencing of 16S rRNA amplicons from isolated fecal DNA and compared with that of 11 nontreated CS-delivered infants and 34 vaginally delivered infants. The fecal microbiota at 3 and 12 weeks was similar between treated CS and vaginally delivered infants, in contrast to that of the untreated CS-delivered infants both in overall composition ($P = 0.001$, Figure) and development of early-life signature bacteria, i.e., bacteroides and bifidobacteria and clostridia ($P < 0.0001$).

Conclusion. The seeding of maternal fecal microbes to the newborn intestine can be safely and successfully mimicked in elective CS by transferring a small amount of maternal fecal microbiome orally to the newborn infant. In these infants, this process results in a microbial development that is highly similar to that of the vaginally born infants, and provides support for the hypothesis that microbial colonization in early life results from a maternal fecal transfer.



Disclosures. **All Authors:** No reported Disclosures.

2844. Butyrogenic Bacteria After Acute Graft vs. Host Disease Associate with the Development of Steroid Refractory GVHD

Jonathan L. Golob, MD, PhD[1]; Martha M. DeMeules, BS[2]; Tillie Loeffelholz, BS[3]; Z.Z. Quinn, BA[2]; Michael K. Dame, BS[4]; Sabrina Silvestri, Bachelors[1]; Michael Wu, PhD[3]; Tom Schmidt, PhD[1]; Tina L. Fiedler, BS[2]; Matthew Hoostal, PhD[1]; Marco Mielcarek, MD[5]; Jason Spence, PhD[1]; Steven A. Pergam, MD, MPH[6] and David Fredricks, MD[7]; [1]University of Michigan, Ann Arbor, Michigan; [2]Fred Hutchinson Cancer Research Center, Seattle, Washington; [3]Fred Hutch, Seattle, Washington; [4]University of Michigan Medical School, Ann Arbor, Michigan; [5]Fred Hutchinsson Cancer Research Center, Seattle, Washington; [6]Fred Hutch Cancer Research Center, University of Washington, Seattle, Washington; [7]Fred Hutch and University of Washington, Seattle, Washington

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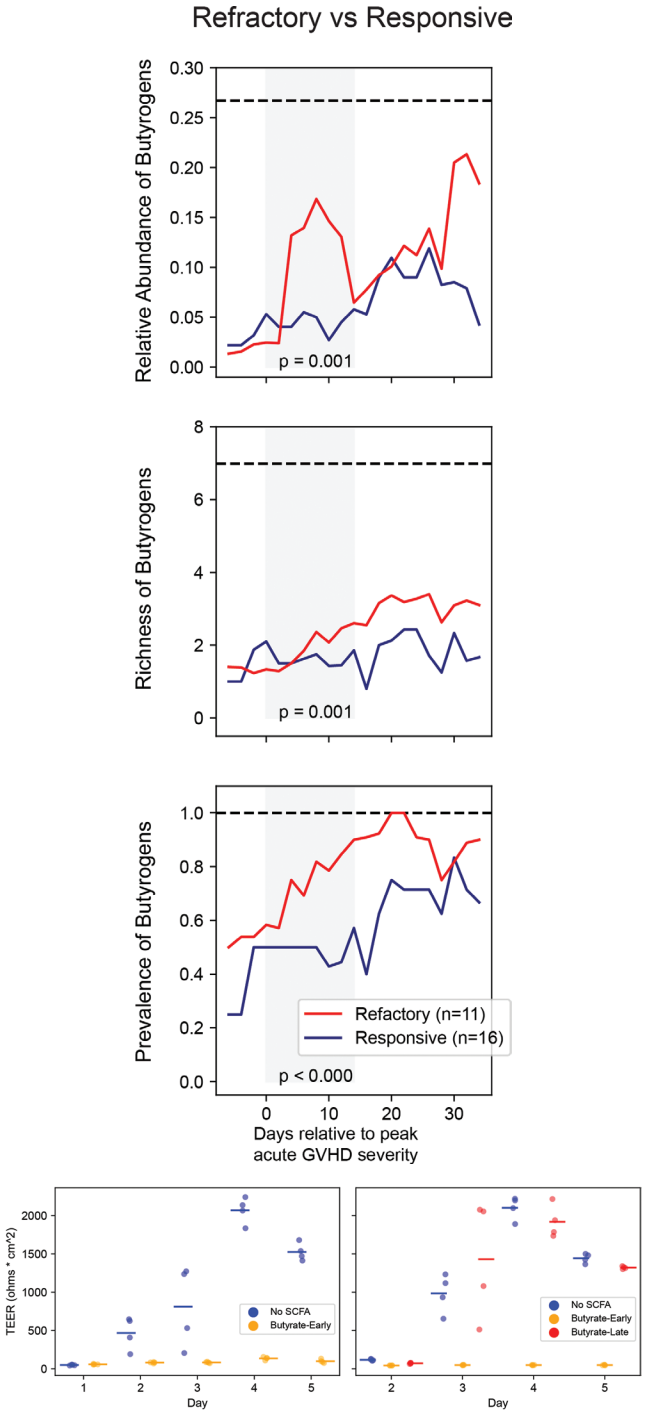
Background. Steroid refractory acute graft- vs. -host-disease (GVHD) after hematopoietic cell transplantation (HCT) is highly morbid with limited treatment options. Murine studies show protection from GVHD with butyrate exposure but direct exposure of stem/progenitor cells to butyrate inhibits colonic stem cell proliferation.

Methods. Stool samples were collected weekly in a cohort of HCT recipients (n = 210) undergoing allogeneic transplant, and underwent 16S rRNA sequencing to determine the number and relative abundance of butyrogens. Dissociated primary human colonoid cell aggregates (200,000 per well) were plated onto collagen IV-coated transwells (0.4 µm pore size, 0.33 cm^2, PET) in stem cell medium for 24 hours. From 24 hours onwards, the basal-lateral chamber was switched to differentiation medium; the apical chamber was Hanks Buffered Salt Solution (HBSS), HBSS with 10 mM butyrate sodium salt early (24 hours onwards) or late (72hours onwards). Trans-epithelial electrical resistance was measured daily.

Results. Retrospective chart review identified 27 recipients who developed acute GVHD of the gut, stratified to be either steroid refractory GVHD (failed to respond to 2 mg/kg of methylprednisolone) or responsive. The presence of butyrogens in the gut microbiome after the onset of severe acute GHVD of the gut associated with increased risk of steroid refractory GVHD (Figure 1; $P < 0.05$). Direct exposure of human colonic stem/progenitor cells to butyrate inhibits the development of trans-epithelial electrical resistance; exposure after differentiation had no inhibition of barrier formation (Figure 2; $P < 0.05$ by T-test).

Conclusion. Butyrogens may help prevent the development of acute GVHD of the gut, but once severe GVHD has developed may inhibit recovery due to the loss of crypt architecture exposing colonic stem cells to microbe-produced butyrate with impaired differentiation and cell replacement.



Disclosures. **All Authors:** No reported Disclosures.

2845. Oral Antibiotic Use and Risk of Colorectal Cancer in the UK, 1989–2012: A Matched Case–Control Study

Jiajia Zhang, MD, MPH[1]; Charles Haines, MD, PhD[2]; Alastair Watson, MD[3]; Andrew Hart, MD[4]; Mary Jane Platt, MD[4]; Drew Pardoll, MD, PhD[2]; Sara E. Cosgrove, MD, MS[5]; Sara E. Cosgrove, MD, MS[5]; Kelly Gebo, MD, MPH[2] and Cynthia Sears, MD[2]; [1]Johns Hopkins Sidney Kimmel Cancer Center, Baltimore,