colitis (UC). It has been reported that FMT with frozen donor faeces (frozen-FMT) is as effective as fresh-FMT for Clostridium difficile infection. However, it is still unclear which donor and condition is suitable for FMT on UC. The aim of this study was to evaluate the effectiveness of frozen-FMT compared to fresh-FMT, and verify effective conditions. Moreover, we explore the concept of best donor for A-FMT success.

Methods: This prospective and randomized controlled study was conducted from July 2017 to September 2019 at Juntendo University Hospital. Eligible patients were at least 20 years of age, with a diagnosis of active UC which were required a Lichtiger’s clinical activity index (CAI) of 5 or more, or with an endoscopic Mayo score of 1 or more. Patients were randomly allocated fresh or frozen faeces from 2 healthy donors. Triple-antibiotic therapy (Amoxicillin, Fosfomycin, Metronidazole; AFM) was administered to patients with UC for 2 weeks, and up to 2 days before FMT. Clinical outcomes were assessed at 8 weeks and 1 year after treatment. Clinical response was defined as a decrease of CAI of 3 points or more, and remission was defined as 3 points or less. Maintenance of efficacy was defined as no exacerbation of CAI and no intensification of treatments.

Results: 29 patients completed protocol (fresh-FMT; n = 15, frozen-FMT; n = 14). At 8 weeks, higher efficacy rates were observed with fresh-FMT compared with frozen-FMT (46.7%, 33.3%), and in frozen-AFM (64.3%, 42.9%) respectively. There were no significant differences in therapeutic effects between frozen-FMT and fresh-FMT. On the other hand, in cases which age difference between donor and patient was more than 16 years, lower efficacy rates were observed with fresh-FMT compared with frozen-FMT (56.2%, 18.7%). The maintenance rate of clinical responder was shown to be significantly higher in A-FMT than in AFM at 12 months after treatment (A-FMT vs mono-AFM (46.7%, 33.3%), and in frozen-AFM (64.3%, 42.9%) respectively. Interestingly, in cases that age difference between patient and donor was 0–15 years, high therapeutic effect was observed in patients treated with fresh-FMT.

Conclusion: This study showed that A-FMT with frozen faeces is as effective as fresh-FMT as long as the age difference is less than 16 years. In addition, the findings from this study indicate that donor selection influences treatment effects, and age difference between patient and donor might be an important factor for A-FMT success.

P073
DIET AS A MICROBIOME-CENTERED THERAPY FOR IBD
Barbara Olendzki, Vanni Bucci, Caitlin Cawley, Beth McCormick, Doyle Ward, Ana Maldonado-Contreras

Your food is your best medicine. Nowhere else is this more true than for those suffering from inflammatory bowel disease (IBD). Thus, we developed the IBD-Anti-Inflammatory Diet (IBD-AID™) to relieve IBD symptoms while providing nutrient adequacy. The IBD-AID™ was designed to increase the diversity of bacteria that produce short-chain fatty acids (SCFAs) to modulate the local immune response. After 4 weeks on the IBD-AID™, patients have reported a reduction of symptoms and medication. Our goal is to define diet-microbiome-inflammation interactions that promote health while consuming the IBD-AID™. We posit that IBD-AID™ favors SCFA-producing bacteria resulting in dampening of inflammation and assisting patient’s remission. We recruited 19 patients with mild to severe CD or UC, to determine diet-dependent changes in the microbiota that could support the hypothesis. The study design was a single-arm prospective, pre-post intervention trial. After a ‘baseline’ period of 4 weeks, the dietary ‘Intervention’ phase started and continued for 8–10 weeks (Fig 1).

We performed metagenomic sequencing of 400+ fecal samples and analyzed 3000 food frequency questionnaires. Most (88.2%) patients achieved ≥50% diet compliance. The IBD-AID™ significantly promoted microbiota signatures that have been associated with colonic health. We found that increased intakes of prebiotic foods correlated with the abundance of SCFAs-producing members of the Bacteroidetes and Parabacteroides. Similarly, increase intakes of probiotic foods during intervention correlated with the abundance of Clostridium bovisae, a bacterium known to play a critical role in the induction of regulatory T cells. We found that vegetable and nuts intake –encouraged in the IBD-AID™ significantly – promoted microbiota signatures that have been associated with colonic health. We found that increased intakes of prebiotic foods correlated with the abundance of SCFAs-producing members of the Bacteroidetes and Parabacteroides. Similarly, increase intakes of probiotic foods during intervention correlated with the abundance of butyrate-producing Roseburia hominis, Eubacterium rectale, and Faecalibacterium prausnitzii. The increased abundance of those SCFAs-producing bacteria after the intervention was accompanied by declines in outpatent pathogenic strains, such as Escherichia sp., Alitipes sp., and Eggerthella sp. The majority (61.3%) of patients treated for at least 8 weeks, who achieved as minimum as 50% dietary compliance reported a dramatic decrease in disease severity.

To examine the role of those diet-dependent microbiome signatures in inflammation, we use P-glycoprotein (P-gp) expression as a biomarker. P-gp is an ABC transporter in epithelial cells implicated in the development and persistence of chronic intestinal inflammation in IBD. We found that fecal supernatants from IBD patients adopting the IBD-AID™ induced P-gp expression. Altogether, these results uncover potential treatment for various disease. However, the therapeutic mechanism is still unclear. We previously demonstrated that fresh-fecal microbiota transplantation following triple-antibiotic therapy (amoxicillin, fosfomycin, and metronidazole; AFM) for ulcerative colitis (UC) patients induced changes in the phylum Bacteroidetes, which constitutes a critical factor correlated with clinical responses. Moreover, we explore the concept of best donor for FMT success.

Methods: This prospective and non-randomized controlled study was conducted from July 2014 to March 2017 at Juntendo University Hospital. Eligible patients were at least 20 years of age, with a diagnosis of active UC which were required a Lichtiger’s clinical activity index (CAI) of 5 or more, or with an endoscopic Mayo score of 1 or more. Patients’ spouses or relatives in the family were selected as donors. Patients were randomly allocated fresh or frozen faeces from 2 healthy donors. Triple-antibiotic therapy was administered to patients with UC at 3 days before fresh FMT. Clinical response was defined as a decrease of CAI of 3 points or more, and remission was defined as 3 points or less. Maintenance of efficacy was defined as no exacerbation of CAI and no intensification of treatments.

Results: Seventy-nine patients completed protocol (A-FMT; n = 47, mono-AFM; n = 32). At 4 weeks after treatment, clinical response and remission were observed in 31 and 19 patients (65.9%, 40.4%) in A-FMT, which higher than in mono-AFM respectively (56.2%, 18.7%). The maintenance rate of clinical responder was shown to be significantly higher in A-FMT than in AFM at 12 months after treatment (A-FMT vs mono-AFM n = 13, 10; P = 0.046). Furthermore, in case that the age difference between donor and patient was more than 16 years, maintenance rate was significantly lower than 0–16 age difference (0–16 vs ≧16, n = 14, 10; P = 0.046). Interestingly, in cases that age difference between patient and donor was 0–15 years, high therapeutic effect was observed in patients treated with fresh-FMT. Conclusion: This study showed that A-FMT with frozen faeces is as effective as fresh-FMT as long as the age difference is less than 16 years. In addition, the findings from this study indicate that donor selection influences treatment effects, and age difference between patient and donor might be an important factor for A-FMT success.