Methods Different forms of bLf (iron-depleted; apo-bLf, iron-saturated; holo-bLf, and manganese-saturated; Mn-bLf) and BSA-FITC were encapsulated in calcium-alginate and chitosan-coated alginate particles. Microgel particles were fabricated using the emulsification/internal gelation method. Protein encapsulation efficiency was confirmed by fluorescence microscopy imaging of BSA-FITC-loaded hydrogel particles. *In vitro* release studies conducted in pH-simulated gastrointestinal conditions were employed to investigate protein-loading efficiency and release rate of encapsulated protein. The various encapsulated bLf forms were evaluated for their influence on intestinal epithelial barrier function and cell viability alone, and in combination with purified whole *C. difficile* toxins A and B or bacterial supernatant samples of the epidemic 027 *C. difficile* strain. Enterocyte viability and epithelial permeability were assessed using trypan blue exclusion, MTT cytotoxicity assay and changes in *trans*-epithelial electrical resistance (TEER) in Caco-2 cells, respectively.

Results Alginate microparticles are suitable for encapsulation and pH-triggered release of metal-bound bLf proteins. The application of bLf (5 mg/mL) delivered from alginate microparticles to human intestinal epithelial cells (hIECs) significantly reduced the cytotoxic effect of toxin A and bacterial supernatant samples on Caco-2 cells, as illustrated by increased TEER values and enhanced Caco-2 cell viability. Pre-treatment of Vero cell monolayers with all forms of encapsulated bLf followed by exposure to toxin B or bacterial supernatant induced a fall in mitochondrial enzyme activity.

Conclusions Our results are the first to suggest that alginate-bLf microparticles show protective effects against *C. difficile* toxin-mediated mucosal damage and impairment of barrier function in hIECs. The future potential of lactoferrin-loaded alginate microparticles in the treatment and prevention of CDI deserves further investigation in preclinical studies.

PTU-047 HIGH PREVALENCE OF CLOSTRIDIUM DIFFICILE RIBOTYPE 078 IN IBD OUTPATIENTS

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Background and Objectives Point prevalence studies have reported higher carriage rates of *C. difficile* in IBD patients compared with the general population, but longitudinal prospective data are lacking. The objectives of this observational study were to investigate and molecularly characterise isolates of *C. difficile*, collected prospectively on a monthly basis over a one-year period among IBD outpatients and healthy controls (HC).

Methods At enrolment, recruited participants had established diagnoses of UC (n=16) and Crohn's disease (n=6) and reported no recent hospitalisation or exposure to antibiotics. PCR ribotype and toxin status (cytotoxigenic culture) were determined for all +ive stool cultures. All participants underwent a monthly telephone interview to identify potential risk factors for *C. difficile* acquisition (changes in medications, exposure to antibiotics, clinic attendances, hospitalisation) and

to assess for disease activity (Harvey-Bradshaw Index and Simple Clinical Activity Colitis Index).

Results Two patients underwent physician-initiated laboratory testing of *C. difficile* during the sample collection phase, although no participants developed or were treated for *C. difficile* infection. *C. difficile* was cultured from 29/223 samples (13%) representing 16/22 patients and 1 of 5 HC with concurrent antibiotic exposure in 6/29 visits (20%). Of the toxin +ive isolates (n=25; 078, 005, 302 and 015), 72% (n=21) were PCR ribotype 078. Toxigenic negative ribotypes included 023, 026 and 656. Of those toxin +ive isolates, 9 samples (36%) were associated with relapsing IBD of which 7/9 were ribotype 078. Multiple stool specimens also tested +ive for different ribotypes in 3 patients with UC, all of whom were taking regular immunosuppressants. WGS studies of the 078 isolates revealed marked genetic similarity, with only 3 of the 21 isolates varying by 1 or more nucleotides when compared to the 078 reference genome, suggesting there may have been a common source for cross-transmission.

Conclusions The high prevalence of PCR ribotype 078 in this IBD outpatient cohort is consistent with the recent emergence of this strain in the community. These results reinforce the importance of testing all in-and outpatients with an apparent flare or relapsing IBD for carriage of toxigenic *C. difficile* to inform optimal management strategies. Future research is needed to understand the predominance of 078 isolates in IBD, particularly in the context of clinical relapse.

PTU-048 SERUM TRACE METAL CONCENTRATIONS IN CLOSTRIDIUM DIFFICILE INFECTION AND THEIR RELATIONSHIP TO DISEASE SEVERITY

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Introduction Trace metals play a central role in host-pathogen interactions, impacting both microbial growth/pathogenicity and antimicrobial host immune defences. The main objective of this study was to determine the relationship between serum trace metal concentrations and severity of *C. difficile* infection (CDI).

Methods We analysed biobanked serum samples previously collected from a single-centre prospective observational study in which we recruited consecutive hospitalised patients ≥18 years with symptomatic toxin-positive *C. difficile* diarrhoea. Severe *C. difficile* was defined as WCC ≥15×10⁹/L or an increase in serum creatinine ≥1.5 above baseline, or pseudomembranous colitis, megacolon, need for colectomy or septic shock requiring ICU admission. Selected trace metal (iron, selenium, zinc, cadmium, cobalt, copper, magnesium, manganese, nickel and lead) concentrations in sera were determined by inductively-coupled mass spectrometry (ICP-MS). Mean biometal concentrations were compared between mild and severe CDI cases using Mann-Whitney test. Univariate and multivariate regression analyses were used to identify clinical and biochemical factors associated with risk of severe CDI.

Results A total of 224 serum samples derived from 149 patients [n=65 male; mean age (S.D.) 65.7 years (16.4); n=84