**POSTER PRESENTER**

**POSTER #9**

**CELL FREE DNA ANALYSIS OF PERITONEAL FLUID IS DIAGNOSTIC OF COMMON AND RARE CASES OF PERITONITIS IN PERITONEAL DIALYSIS PATIENTS**

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**BACKGROUND:** Peritoneal dialysis (PD) is a lifesaving therapy for patients with end stage kidney disease, but peritonitis, a frequent infectious complication, limits its efficacy. Although microbial culture of the peritoneal fluid is currently the definitive diagnostic approach, in 20% of suspected peritonitis cases the causative organism cannot be identified. We investigated the utility of cell free DNA (cfDNA) in peritoneal fluid as an alternative assay to identify pathogens in peritonitis cases.

**METHODS:** We recruited 27 PD patients: 10 patients developed culture positive peritonitis and provided 19 peritoneal fluid samples and 17 patients did not develop evidence of confirmed peritonitis and provided 37 peritoneal fluid samples. cfDNA was extracted from the peritoneal fluid samples and was sequenced using an Illumina NextSeq 500 platform using 2x75bp paired-end sequencing. Identification of microbial DNA was performed utilizing the maximum likelihood estimator of relative genomic abundance based on alignment of reads to an NCBI database of bacteria, fungus, and DNA virus genomes.

**RESULTS:** In the 10 patients with culture-positive peritonitis, cfDNA analysis found the suspected causative organism in all 10 patients (Fig. 1). In the 5 peritonitis patients who had follow-up samples after treatment, the abundance of the suspected organisms decreased after treatment (Fig. 1). Peritoneal fluid cfDNA identified a case of fungal *Candida* peritonitis, which was difficult to diagnose clinically, and in another case, peritoneal fluid cfDNA identified *Enterococcus faecium* and *Parabacteroides distasonis*, which was later confirmed to be the infectious cause for abdominal pain originating from a gallbladder infection.



**CONCLUSIONS:** Peritoneal fluid cfDNA sequencing can detect infections in peritoneal dialysis patients and support future studies of this technique in the subset of culture negative peritonitis.

**CONTENT CATEGORY:** transitional science

**KEYWORDS:** *cell-free DNA, microbiota, peritoneal dialysis, peritonitis*

**Figure 1**