**VASCULAR ACCESS AND PERITONEAL DIALYSIS**

**SaO011 1H NMR BASED METABOLOME DIFFERENTIATE BACTERIAL AND FUNGAL PERITONITIS AND CAN PREDICT RELAPSING PERITONITIS**

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**Introduction and Aims:** Conventional culture methods for the diagnosis and identification of micro-organisms are inherently slow and inefficient and in many cases culture yield is negative despite clinical evidences of infection. It is important to differentiate bacterial and fungal peritonitis as treatment line of both are different. Presently, the diagnosis of relapsing peritonitis depends on the reappearance of peritonitis. Bacteria and fungus may have different metabolome as one is prokaryotic and another is eukaryotic microorganisms. We aimed the study to differentiate fungal and bacterial peritonitis based on this NMR metabolome and serial monitoring of metabolome on NMR spectra in predicting relapsing peritonitis.

**Methods:** Five unused PD fluid, 13 PD effluent from normal adult PD and 45 PD effluents from 15 patients with bacterial peritonitis including 3 who relapsed and 3 fungal peritonitis PD effluents were included in the study. PD effluent was soon frozen at a temperature of -80°C for NMR analysis. Relapsing peritonitis was defined by an episode that occurs within 4 weeks of completion of therapy with the same organism. 1H NMR Spectroscopy: Five samples of 2.5% unused normal PD fluid, and all PD effluents subjected for 1H NMR Spectroscopy. High Resolution NMR spectra were recorded at 298 K on a Bruker Avance III 800 MHz spectrometer, equipped with Cryoprobe. Standard relaxation edited 1D 1H NMR spectra were acquired using the Carr-Purcell-Meiboom-Gill (CPMG) pulse sequence. Each spectrum consisted of the accumulation of 64 scans and lasted for approximately 8 minutes. To confirm assignment of marker peak, 2D 1H-1H TOCSY and 1H-13C HSQC spectra were acquired for all the samples.

**Results:** Five unused normal PD effluent and 13 normal PD effluents after 6 hours of dwell did not show any peak at NMR spectra between 0.45 to 0.65 ppm while all the 15 cases of bacterial peritonitis showed peak at NMR spectra between 0.45 to 0.65 ppm and these peaks were disappeared after treatment with resolution of peritonitis at end of 1 week and 2 weeks of antibacterial therapy except for 3 cases in whom peak was persisting despite absence of clinical and laboratory evidences of peritonitis and all these patients presented with relapsing peritonitis within 2 weeks of stopping antibiotics. The three cases who had culture positive fungal peritonitis also did not show any peak at this region on NMR spectra. The absence of marker spectra between 0.45 - 0.65 ppm of NMR in presence of clinical evidence of peritonitis suggest fungal peritonitis, thus quickly differentiating it from bacterial peritonitis. (Figure 1). The signal between 0.45 and 0.65 ppm might represent cumulative NMR signal from trans methylene protons of cyclopropane ring moiety (as per the assignment of cyclopropane ring reported earlier and also depicted in Figure 1.

**Conclusions:** The NMR spectra between 0.45 - 0.65 ppm consistent with cyclopropane signal could be used as metabolomic marker to differentiate bacterial from fungal peritonitis and persistence of this signal at 2 weeks even after completion of therapy could be used as predictor of relapsing peritonitis.

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