

Preliminary Results Using a Novel Microbicidal Liquid Polymer (Preventogen) for the Reduction of Catheter Site Infections in Patients receiving Hemodialysis through Tunneled Hemodialysis Catheters

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BACKGROUND:

Catheter related bloodstream infections (CRBSI) from the use of tunneled hemodialysis catheters (THDC) are reported to be 1.1 to 6.1 episodes per 1000 catheter days and are associated with increased morbidity, hospitalization, and death (Martin, 2020). Various dressings (SOC) such as Coversite, Tegaderm and Biopatch/CHG are currently used at the catheter exit site (ES) to reduce infection and decrease CRBSI without significant impact on CRBSI rates. Preventogen, a novel microbicidal Liquid Polymer, which on drying forms an occlusive elastomeric barrier around the THDC at the ES has been shown to actively kill pathogens such as MDRO and Non-MDRO gram positive & negative bacteria, and various fungi on contact through cell lysis. Our objective was to evaluate the impact of Preventogen, on catheter site infection rates. We hypothesized that the use of Preventogen will protect patients undergoing dialysis with THDC against bacterial and fungal infections.

METHODS:

Under an IRB approved protocol, a retrospective review of a prospective data base of patients that had de novo THDC placement for HD at three dialysis centers was performed from 6-1-24 to 12-11-24. For each patient, Preventogen was applied for 1 inch around the tunneled hemodialysis catheter at the insertion site and catheter during placement and reapplied weekly thereafter at HD session for a total period of 180 days or until an ES infection or CRBSI developed. Age, gender, race, comorbidities (HTN, CHF, DM, Tobacco, ETOH use, Cirrhosis, Cancer, Obesity, Anticoagulation), CKD stage, insertion site, type of catheter, catheter days, ES infections and CRBSIs were collected. ES infection and CRBSI rates were calculated as number of infections per 1000 catheter days and compared to historical documented rates using SOC dressings.

RESULTS:

To date, 38 out of 60 patients have been enrolled in this prospective study. All patients were $\geq$ CKD 3 stage. The median age was 59 yo, 20(53%) were Males, 21(55%) White, 15(40%) Black, 2(5%) Other. Comorbidities included 26(68%) HTN, 18(47%) ETOH use, 14(37%) Smokers, 14(37%) Obese (BMI>30), 14(37%) on Anticoagulation, 12(36%) Diabetic, 10(26%) CHF, 9(24%) Cirrhotic, and 7(18%) Cancer. The IJ site was used in 34(89%). THDC catheters inserted were 22(59%) silicone and 16(41%) polyurethane. Over the study period with 4090 catheter days there were no CRBSI, and only 1(2.6%) catheter was exchange due to a suspected ES site infection with cultures demonstrating no growth. In contrast, historical data collected at the same dialysis centers demonstrated that 5.2% (33 of 637) of THDC were removed secondary to infection.

TABLE 1

Total cases: 38 All patients were ≥ CKD 3 stage	Demographics: Median age: 59 years 20(53%) Male 21(55%) White 15(40%) Black 2(5%) Other	Comorbidities included: 26(68%) HTN 18(47%) ETOH use 14(37%) Smokers 14(37%) Obese (BMI>30) 14(37%) on Anticoagulation 12(36%) Diabetic 10(26%) CHF 9(24%) Cirrhotic 7(18%) Cancer	
Total catheter days: 4,090 days			
Total CRBSI: 0			
Catheter exchange: 1 (2.6%)			
Exit site infections: 0			
NOTE: Historically 5.2% (33 of 637) catheters were removed due to infection			

CONCLUSIONS:

Given the reported ES infection rate of 4.1 per 1000 catheter days and CRBSI of 4.5 per 1000 catheter days, in this ongoing study, preliminary results demonstrate that the use of Preventogen liquid polymer as a dressing for THDC was safe with no documented ES infections and no cases of CRBSI over 4090 catheter days. Further study is ongoing.

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