

PUB321

Incidence of Central Venous Stenosis in Patients with Chronic Renal Failure after IJ Catheter Placement *Mary S. Hammes, Amishi S. Desai, Brian Funaki, Annette Jean Herlitz. Medicine, University of Chicago, Chicago, IL.*

Background: The arteriovenous fistula (AVF) is the preferred access for hemodialysis, with the successful creation dependent on preservation of veins. Previous damage to veins from B/P cuffs, phlebomy and peripherally inserted central venous catheters (PICC) limit sites for AVF creation. It is recommended that an alternative to a PICC line, a small bore internal jugular catheter (SBIJ) be used for short term access in patients with chronic renal failure (CRF) to preserve veins. The incidence of stenosis with SBIJ has not been studied. This investigation was performed to determine if complications including stenosis occur with SBIJ catheters.

Methods: Patients were enrolled by written consent if they had evidence of CRF stage 3 or greater (GFR<59 mL/min), end-stage renal disease or a history of renal transplantation and required short-term venous access with a central catheter. Subjects were screened for inclusion by daily review of the Procedure Service consult log by a Nephrologist. If patients agreed, they were scheduled for a SBIJ placement in Interventional Radiology. A venous Doppler was performed during insertion and removal of the SBIJ to evaluate for stenosis, thrombosis as well as the diameter of the IJ vein. Patient demographics and indication for SBIJ were recorded.

Results: 26 patients were enrolled and 28 SBIJ were placed, 2 patients had catheters placed on 2 separate occasions. Demographics included: 11 (42.3%) males and 14 (53.8%) African Americans, 8 (28.6%) had a solid organ transplant, 7 (25%) had stage 3 or greater CRF and 13 (46.4%) ESRD. Indications for catheter placement included: 13 (46.4%) immunosuppression, 11 (39.3%) antibiotics, 1 (3.6%) TPN and 3 (10.7%) a combination. A right SBIJ was placed in 23 (82.1%) subjects and a left in 5 (17.9%). The average number of catheter days was 16.7. The incidence of IJ thrombosis at time of line removal was evident in 1 out of 26 subjects or 4%.

Conclusions: Placement of SBIJ catheters in patients with CRF for short term IV access is a safe procedure with a low risk of IJ thrombosis. Efforts to avoid PICC catheters should be made in this population as future permanent access may be required.

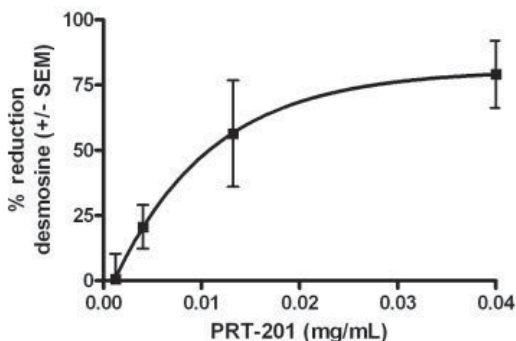
PUB322

Measurement of Elastin Content of Human Cephalic Vein Following Treatment with PRT-201, a Recombinant Human Type I Pancreatic Elastase *Steven K. Burke,¹ Marco D. Wong,¹ Karen Macdonald,² Emma J. Moss,² Kimberly S. Bland,¹ Nicholas Franano.¹ ¹Proteon Therapeutics, Inc., Waltham, MA; ²Bioptra Ltd., Glasgow, United Kingdom.*

Background: This study explored the effect of PRT-201 on elastin content of human cephalic veins obtained from recently deceased donors. The veins were studied in a perfusion myograph to simulate the pressure in the outflow vein of an arteriovenous fistula.

Methods: Veins were retrieved within 24 hours post-mortem, cut to 2.5 cm segments, and mounted on a myograph. Saline was perfused through the lumen of the segments at a transmural pressure of 25 and 50 mm Hg. PRT-201 0.0012, 0.004, 0.0132, and 0.04 mg/mL or saline was applied in a volume of 2.5 mL drop-wise over 10 minutes on the external surface of the vein followed by rinsing with saline. The vein segments were removed from the myograph and stored in saline for 3 hours at RT then at 4°C overnight before formalin fixation. Vein segments were cut into rings for desmosine (a protein cross-link unique to elastin) content by RIA, histology for the visualization of elastin fibers, and PRT-201 fluorescence. For fluorescence, PRT-201 was fluorescently labeled with Dylight 633 and dosed at a concentration of 0.012 mg/mL. Adventitial imaging was performed using laser scanning confocal microscopy at 633 nm.

Results: Figure 1 shows the percentage reduction in desmosine content by PRT-201 concentration.



Histology confirmed a concentration-related reduction in elastin fiber staining. Confocal microscopy demonstrated persistent localization of PRT-201 to elastin fibers following saline rinsing.

Conclusions: PRT-201 caused a concentration-related reduction in elastin content of human cephalic veins. PRT-201 remained bound to elastin in the vein after washing suggesting prolonged PRT-201 activity following a 10 minute-application.

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PUB323

Uric Acid and Risk of Catheter Related Bacteremia in Hemodialysis Patients *Pavan K. Annamraju, Seyed-Ali Sadjadi, Navin Jaipaul. Nephrology, VAMC, Loma Linda, CA.*

Background: In vitro studies demonstrate a paradoxical antioxidant effect of hyperuricemia in the extracellular milieu compared to its pro-oxidant effect in adipocytes. Similarly, previous clinical studies suggest hypouricemia impairs plasma antioxidant capacity in sepsis. It is biologically plausible, therefore, that uric acid (UA) level may modify the risk of catheter related bacteremia (CRB) in hemodialysis (HD) patients. We conducted a single center cohort study to determine if lower UA level may be independently associated with increased risk of HD CRB.

Methods: We identified by CPT code prevalent HD patients over a 2 year period who had tunneled catheter placed. Patients were followed for up to 1 year until they developed CRB or the end of the study period. CRB was determined by chart review and defined as ≥1 positive blood culture with the same organism, clinical signs of infection, and no alternative source for infection. Additional demographic and laboratory variables were collected and averaged over a 3 month period immediately preceding the CRB event. Patients with active malignancy, receiving chemotherapy, or missing UA levels were excluded. Ultimately, 51 patients were included in the final analysis performed using SPSS version 20.

Results: Refer to the table.
Comparison of Patients with and without CRB

Variable	No CRB (N=35)	CRB (N=16)	p-value
Age, years	61.4±12.6	59.0±10.7	0.49
Male sex, n	33	15	0.94
White race, n	23	10	0.26
Hypertension, n	35	16	-
Diabetes, n	28	11	0.38
Coronary artery disease (CAD), n	15	12	0.03*
Allopurinol use, n	2	2	0.40
Body mass index, kg/m ²	27.3±5.7	27.5±6.8	0.95
Albumin, mg/dL	3.1±0.5	3.0±0.8	0.67
Calcium x Phosphorus, mg ² /dL ²	46.9±11.1	42.9±11.2	0.25
Ferritin, ng/mL	375.1±368.7	302.2±200.0	0.38
Uric acid (UA), mg/dL	6.7±1.3	5.8±0.8	0.004*

*p<0.05

The rate of CRB was 0.70/1000 catheter days. Each 1 mg/dL increase in UA level was associated with a 58% reduced risk of CRB (OR=0.42; 95% CI 0.18-0.95), even after adjustment for CAD, catheter days, and dialysis vintage. Despite the small sample size, our study had 85.7% power to detect a 1 mg/dL difference in UA level between patients with and without CRB.

Conclusions: These findings suggest that lower UA level may be an independent risk factor for HD CRB.

PUB324

Tunneled Hemodialysis Catheters: A Single Center Report on a Change in Access Delivery *Jennifer Palfrey, Iain Moore, Debbie Sweeney, William Hinchliffe, Saed Ahmed. Department of Renal Medicine, City Hospitals Sunderland, Sunderland, United Kingdom.*

Background: Our renal unit has established experience of placing size 10 French independent hemodialysis catheters (Tesio®). Following promising data showing reduced infection & catheter dysfunction, we introduced use of a single split 14.5 French catheter with a spiral Z tip design (Palindrome™) for long term hemodialysis access.

Methods: We collected retrospective data from medical records and the renal database system for all patients who had undergone placement of Palindrome catheters from March 2010 until December 2011.

Results: Sixty-six lines were placed in 59 patients of whom 39% of patients had no long-term haemodialysis access prior to insertion of Palindrome. One line was placed into the femoral vein; all others were placed in the internal jugular vein (77% right-sided). No complications were experienced at the time of insertion. Seventy-two percent were placed using real time ultrasound guidance; the remainder also required fluoroscopic screening. We have of 7452 catheter days (excluding data from 5 patients who died with functioning lines insitu). Forty-four percent of lines remained in use at the end of the data collection period. Of the 32 lines removed, 50% were removed electively. Nineteen percent of lines were removed for infection. Catheter dysfunction accounted for 16% of line removals. In addition, 6% were removed for cuff slippage. Vascular compromise necessitated one line removal. Of the 5 patients with line dysfunction, 3 patients had another Palindrome line placed, 2 had a Tesio. Two patients lost central access requiring tunneled femoral lines.

Conclusions: We have accrued significant experience in using Palindrome and Tesio catheters. We believe this to be the largest data set collected in a UK centre regarding Palindrome use. We have found them to be suitable for the majority of patients and note comparable data to previously reported. However, 28% of Palindrome lines required fluoroscopic assistance for placement, adding to access planning, resource availability and patient inconvenience. We continue using both types of tunneled lines with individual vascular evaluation prior to selection of line type.