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Pulmonary Hypertension in ESRD: Pre-Capillary, Post-Capillary, or Both? Examining Hemodynamic Profiles of an Inner City Population via Right Heart Catheterization

Mendis BL, Salata B, Park M, Murthy S

Montefiore Medical Center, New York, NY

Purpose: While there is a previously established association between end stage renal disease (ESRD) and the progression of pulmonary hypertension (PH), we seek to identify epidemiological characteristics of high-risk patients with ESRD and PH undergoing evaluation for renal transplantation.

Background: There is a growing body of literature examining the prevalence, pathophysiology, and progression of PH in End Stage Renal Disease (ESRD). The PEPPER trial was among the first prospective trials to examine, via right heart catheterization (RHC), hemodynamic changes occurring pre and post hemodialysis in PH patients.

There are currently no studies examining invasive hemodynamic measurements on ESRD/PH patients in a largely African American and Hispanic population. We sought to compare epidemiologic and hemodynamic observations of our patient cohort to previously published data. This would allow us to better appreciate potential differences in the underlying pathophysiology and perhaps identify a group of patients who may benefit from increased surveillance and evaluation for therapy.

Methods: We present a single center, retrospective cohort study of 34 ESRD patients on HD with PH (mPAP ≥ 25mmHg). Our inclusion criterion was patients with ESRD on HD with PH diagnosed by RHC performed post-hemodialysis. Pre-capillary PH was defined as mPAP ≥ 25mmHg with PCWP ≤ 15mm Hg. Pulmonary vascular resistance (PVR) was quantified in Woods units. Patient demographics including age, race, gender, comorbidities and current medications were retrospectively obtained from chart review.

Results: In our study, RHC performed post-dialysis revealed pre-capillary PH in 16/34 (47.1%) of cases and post-capillary PH in 18/34 (52.9%) of cases. This is significantly different from the results published in the PEPPER trial, in which 4/31 (12.9%) of cases were found to be pre-capillary and 27/31 (87.1%) were found to be post-capillary. Additionally, we found 18/34 (52.9%) of our patients to have PVR > 3, which was significantly higher than the Wolfe et al trial examining renal transplant outcomes in PH, in which 20.5% of patients had PVR > 3. Within our cohort, patients were 58.8% African American, 32.4% Hispanic, 8.8% chose not to self-identify, and 0% Caucasian. There was no significant difference between African American and Hispanic mean mPAP, PCWP, or PVR.

Conclusions: In our low socioeconomic region primarily comprised of Hispanic and African American populations, we present a drastically different hemodynamic profile from prior literature. While most studies leave out this important demographic data, those that report are primarily Caucasian. Prior studies have shown that endothelin-1 is disproportionately elevated in African Americans, possibly playing a role in the unique hemodynamic profile observed in our population. Having an understanding of patient risk for pre-capillary PH and higher PVR may guide clinical decisions including initiation of dialysis as well as modality of dialysis, as some data has shown a reduced incidence of PH in patients receiving peritoneal dialysis. Our hope is to increase research in this domain so as to manage high-risk populations appropriately.

PH PN SYMPOSIUM

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