

Introduction

In British Columbia, 36% of patients who chose peritoneal dialysis (PD) after predialysis renal replacement therapy (RRT) education actually started and remained on long-term haemodialysis (HD). This dramatically reduced the number of patients starting HD with arteriovenous fistula (AVF). Better identification of patient and system factors that predict failure to commence PD for those who chose it predialysis would allow for AVF creation in this group of patients.

Aim

To determine what demographic, clinical or system factors identify those patients who chose PD but ended up starting on HD.

Methods

- A retrospective cohort study of prospectively collected data in British Columbia using a provincial CKD patients registry (PROMIS).
- Inclusion criteria:
 - All patients starting dialysis between Dec 31, 2006 and Dec 31, 2008 who had chosen PD as their preferred modality prior to starting RRT.
 - Minimum 90 days on dialysis to ensure RRT was chronic.
- A minimum 3 months predialysis follow-up.
- At least 1 predialysis RRT education session.
- Exclusion criteria:
 - Any patients with previous RRT including prior transplantation.

Statistical Methods

- Categorical variables were summarized using frequency and percentage with differences measured using the χ^2 – test.
- Normally distributed continuous variables were summarized using the mean \pm SD with differences measured using a t-test.
- Non-normally distributed continuous variables were summarized using the median (IQR) with differences measured using the non-parametric Wilcoxon test.
- To assess which factors are associated with HD vs PD start, logistic regression analysis was used.

Results

- 114 patients had chosen PD and met study inclusion criteria.
 - 73 (64%) started on PD.
 - 41 (36%) started on HD.
- Of the 41 patients who started HD, 6 subsequently switched to PD.

Results

Table 1: Baseline characteristics of patients according to dialysis start modality

Variable	PD choice and HD start	PD choice and PD start	P value
Total number of patients	41	73	
Age at dialysis start	70 (60-78)	63 (54-71)	0.04
Male gender	24 (59%)	38 (52%)	0.50
Diabetes	20 (49%)	30 (41%)	0.43
Cardiovascular disease	20 (49%)	21 (29%)	0.03
Race			0.71
Caucasian	23 (56%)	41 (56%)	
Asian Oriental	6 (15%)	14 (19%)	
Asian South/East	7 (17%)	9 (12%)	
Other	5 (12%)	9 (12%)	
Physical exam			
Weight in kg	71.4 (62.6-88.6)	76.0 (63.4-86.4)	0.88
Height in cm	164.0 (157.5-175.0)	167.0 (157.9-176.0)	0.71
BMI	26.6 (23.8-30.0)	25.8 (23.9-30.9)	0.65
Lab values			
Albumin in g/l	34.0 (29.0-39.0)	37.5 (33.5-40.0)	0.03
eGFR	10 (9-12.2)	11 (8-13)	0.54
# of GFR measurements in 12 months prior to dialysis start	13 (10-16)	11 (9-13)	0.03
eGFR slope in year prior to dialysis	-6.86 (-10.36 to -2.73)	-5.72 (-9.56 to -2.74)	0.66
Months of nephrology follow-up	26 (12-38)	29 (12-42)	0.89

Table 2: Univariate analysis of factors predicting HD vs PD start

Variable	Odds Ratio	95% CI	P value
Age at dialysis start	1.030	0.999-1.063	0.059
Male gender	1.300	0.601-2.819	0.505
Diabetes	1.365	0.632-2.947	0.428
Cardiovascular disease	2.358	1.065-5.221	0.034
Race			
Caucasian	Reference		
Asian Oriental / Filipino	1.114	0.435-2.854	0.822
Other / Unknown	0.891	0.331-2.400	0.819
Physical exam			
Weight in kg	1.004	0.985-1.023	0.689
Height in cm	0.999	0.961-1.037	0.938
BMI	1.019	0.948-1.096	0.609
Lab values			
Albumin in g/l	0.916	0.855-0.982	0.013
eGFR	1.012	0.936-1.095	0.757
# of GFR measurements in 12 months prior to dialysis start	1.032	0.977-1.091	0.261
eGFR slope in year prior to dialysis	0.979	0.943-1.017	0.272
Months of nephrology follow-up	0.999	0.981-1.018	0.952

Results

Table 3: Multivariate analysis of factors associated with HD vs PD start

Variable	Odds Ratio	95% CI	P value
Cardiovascular disease	2.356	1.022-5.429	0.044
Serum albumin before dialysis	0.917	0.855-0.983	0.015

Patients with cardiovascular disease and lower serum albumin levels who chose PD were more likely to start HD.

Discussion

- Patients who chose PD but ended up starting HD were likely to be older, had a history of cardiovascular disease and lower serum albumin levels.
- There was no difference in gender, race, presence of diabetes, BMI or duration of nephrology follow-up between the group starting HD versus those starting PD.
- There was no difference in the rate of eGFR decline over the preceding year suggesting that the patients who started HD instead of PD were likely not patients who deteriorated rapidly and required urgent dialysis start.

We recommend

- RRT choice should be re-discussed with patients at regular intervals.
- Specific attention should be paid to older patients with cardiovascular disease who have chosen PD to ensure that they are still likely to start on PD.
 - They should be educated regarding at least a 40% chance of needing to start on HD instead of PD.
 - They should be considered for referral for vascular access creation.
- These measures should help to address the issue of lower AVF creation rates in patients who chose PD but started on HD.

Conclusions

A significant proportion of patients who chose PD failed to commence their modality of choice and started on HD instead. These patients were older, had a history of cardiovascular disease and lower serum albumin levels. Careful attention should be given to this group of patients to ensure PD remains a reasonable modality choice and to consider AVF creation. Identification of and AVF creation in these patients at high risk for not commencing PD as their modality of choice should help to improve AVF prevalence rates at HD start.