



Prescription Patterns in Dialysis Patients – differences between hemodialysis and peritoneal dialysis and opportunities for deprescription

Judith G Marin PharmD^{1,2}, Laura Beresford PharmD², Gabriela Espino-Hernandez MA, MSc³ and Monica C Beaulieu MD, FRCPC^{1,3,4}

¹St. Paul's Hospital, Vancouver ²Faculty of Pharmaceutical Sciences, University of British Columbia ³BC Provincial Renal Agency, ⁴Department of Medicine, University of British Columbia



Background

- Dialysis patients are complex. They have an average of 5 to 6 chronic medical conditions and are prone to polypharmacy, with an average of 8 to 12 prescribed medications.¹
- A higher number of prescribed medications in hemodialysis (HD) patients are associated with reduced quality of life, lower adherence to treatment, and increased mortality risk.²⁻³
- Deprescribing is defined as "the process of tapering, stopping, discontinuing or withdrawing drugs, with the goals of managing polypharmacy and improving outcomes".
- "Potentially inappropriate medications" (PIMs) are defined as medications with no clear evidence-based indication, which carry higher risk of adverse effects or are not cost-effective.⁴
- Prescribing patterns and burden of polypharmacy in dialysis patients, and specifically the difference between hemodialysis and peritoneal dialysis prescribing are not well characterized.

Objectives

- To analyse hemodialysis (HD) and peritoneal dialysis (PD) patient medication prescribing patterns in the province of British Columbia (BC), Canada.
- To quantify the amount of polypharmacy in our population and to determine the frequency PIMs – which will allow us to target potential opportunities for deprescription.

Methods

Study design:

- Population-level retrospective cohort study (n=3,017) analysing demographic and medication data for patients who were on chronic dialysis from June 3rd 2015 to October 1st 2015.

Inclusion criteria:

- Age ≥ 18 years
- Patient on chronic dialysis (HD or PD) for more than 120 day.

Data sources:

- All BC dialysis patients are registered in the Patient Records and Outcomes Management Information System (PROMIS) database.
- This database contains demographic data, comorbidities, laboratory values and medication profile.
- Medication reconciliation is performed every 6 months to ensure accurate medication profiles
- Medications were classified by indication as either renal complication management, cardiovascular disease, diabetes, symptoms management or others.
- PIMs were defined a priori by a group of expert Canadian nephrology health professionals working on this topic.

Results

Table 1. Demographic characteristics of the cohort.

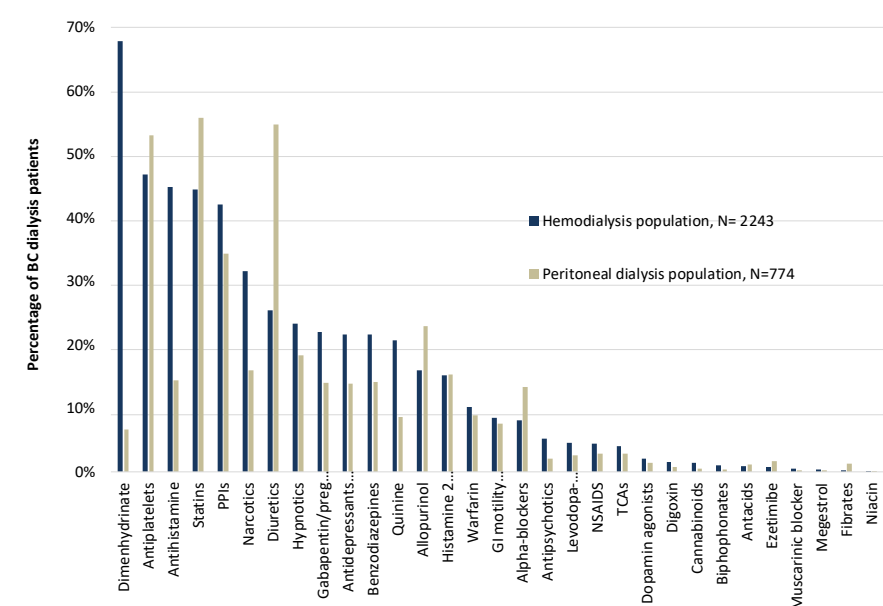
	Overall	HD	PD
Final cohort (patients): N	3017	2243	774
Age: mean (SD)	66.2 (14.8)	67.7 (14.7)	64.2 (14.4)
Age group: N (%)			
18 ≤ Age < 40 y/o	183 (6.1%)	132 (5.9%)	51 (6.6%)
40 ≤ Age < 65 y/o	1041 (34.5%)	740 (33%)	301 (38.9%)
65 ≤ Age < 80 y/o	1201 (39.8%)	876 (39.1%)	325 (42%)
Age ≥ 80 y/o	592 (19.6%)	495 (22.1%)	97 (12.5%)
Male sex: N (%)	1824 (60.5%)	1336 (59.6%)	488 (63%)
Race: N (%)			
Asian Indian	396 (13.1%)	315 (14%)	81 (10.5%)
Asian Oriental	610 (20.2%)	426 (19%)	184 (23.8%)
Caucasian	1730 (57.3%)	1285 (57.3%)	445 (57.5%)
Others	281 (9.3%)	217 (9.6%)	64 (8.2%)
Comorbidities: N (%)			
Diabetes	2098 (69.5%)	1588 (70.8%)	510 (65.9%)
Median Dialysis vintage (yrs) [IR]	3.3 [1.7 - 6.1]	3.8 [1.8 - 7.1]	2.4 [1.3 - 3.9]
Dialysis vintage group: N (%)			
≤ 1yr	419 (13.9%)	283 (12.6%)	136 (17.6%)
1 to 3yrs	982 (32.5%)	631 (28.1%)	351 (45.3%)
> 3yrs	1616 (53.6%)	1329 (59.3%)	287 (37.1%)

Table 2. Prescription patterns in BC dialysis patients.

	Overall	HD	PD
Final cohort (patients): N	3017	2243	774
Mean number medications per patient (SD)	17.7 (5.7)	18.1 (5.9)	16.7 (5.0)
Mean number PRN meds per patient (SD)	5.3 (3.1)	5.7 (3.2)	4.2 (2.2)
Mean number meds by patient (SD)			
Cardiology	3.5 (2.0)	3.5 (2.0)	3.6 (2.0)
DM	0.6 (0.8)	0.6 (0.8)	0.7 (0.9)
Renal	4.7 (1.4)	5.0 (1.3)	3.9 (1.2)
Symptoms	5.8 (3.0)	6.0 (3.2)	5.2 (2.2)
Others	3.1 (2.3)	3.0 (2.3)	3.5 (2.1)
Mean number of meds (SD)			
DM pts	18.5 (5.7)	18.7 (5.9)	17.8 (4.8)
Non DM pts	15.9 (5.5)	16.5 (5.7)	14.6 (4.6)
Mean number of meds by age group (SD)			
18 ≤ Age < 40 y/o	15.4 (6.1)	16.1 (6.4)	13.4 (4.8)
40 ≤ Age < 65 y/o	17.7 (5.8)	18.1 (6.1)	16.5 (4.8)
65 ≤ Age < 80 y/o	18.4 (5.6)	18.7 (5.8)	17.3 (5.0)
Age ≥ 80 y/o	17.3 (5.4)	17.2 (5.4)	17.3 (5.1)
Mean number of meds by dialysis vintage group (SD)			
≤ 1yr	16.9 (5.8)	17.3 (5.9)	16.1 (5.0)
1 to 3 yrs	17.6 (5.6)	18.2 (5.8)	16.5 (4.9)
>3 yrs	18.0 (5.8)	18.2 (5.6)	17.3 (5.0)
Mean number of PIMs per patient (SD)	5.0 (2.8)	5.4 (2.8)	4.0 (2.4)
Mean number of PIMs by meds categories (SD)			
Cardiology	1.5 (1.2)	1.4 (1.1)	1.8 (1.3)
DM	0	0	0
Renal	0	0	0
Symptoms	3.3 (2.3)	3.7 (2.3)	2.1 (1.8)
Others	0.2 (0.4)	0.2 (0.4)	0.1 (0.3)
Mean number of PIMs by age group (SD)			
18 ≤ Age < 40 y/o	3.6 (2.9)	4.2 (3.0)	2.1 (2.0)
40 ≤ Age < 65 y/o	4.9 (2.9)	5.4 (3.0)	3.9 (2.3)
65 ≤ Age < 80 y/o	5.3 (2.6)	5.7 (2.7)	4.4 (2.2)
Age ≥ 80 y/o	5.1 (2.7)	5.2 (2.7)	4.3 (2.7)
Mean number of PIMs by dialysis vintage group (SD)			
≤ 1yr	4.5 (2.8)	5.0 (2.8)	3.5 (2.4)
1 to 3 yrs	4.9 (2.7)	5.5 (2.8)	4.0 (2.3)
>3 yrs	5.2 (2.8)	5.4 (2.8)	4.3 (2.4)

Results

Figure 1. Percentage of PIMs in BC dialysis patients.



Discussion

- Patients on dialysis were prescribed a median of 17 distinct medications, including prescription and over the counter drugs.
- The mean number of prescribed medications in the HD cohort was slightly greater than the PD cohort. The HD cohort were older and had a longer dialysis vintage.
- More than 1/3 of prescribed medications were for management of end stage kidney disease (ESKD) related symptoms.
- Almost all (97.3%) patients had one or more PIMs prescribed. As a comparison, a Japanese study evaluating PIM frequency found that 57% of their elderly Japanese HD population was prescribed a PIM.⁵
- We estimated that \$90,000 annually was spent on PIMs by the BC renal agency. Reducing the prescribing of PIMs would allow funding of medications that are more effective, and safer in our specific population.
- This is the first study that we are aware to look at prescription patterns in a PD population.

Conclusion

- Based on the prescription patterns observed in this study, we conclude that both HD and PD patients continue to experience polypharmacy and the associated risks. Older patients and longer dialysis vintage increase polypharmacy risk in the HD and PD cohort.
- PIMs were commonly prescribed in our dialysis population.
- There are opportunities for conducting and evaluating deprescribing initiatives in both HD and PD patients.

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