Evidence Series: Study

Time on Therapy of Automated Peritoneal Dialysis with and without Remote Patient Monitoring: A Cohort Study

Mauricio Sanabria, Jasmin Vesga, Bengt Lindholm, Angela Rivera and Peter Rutherford

International Journey of Nephrology. 2022;
Article ID 8646775, 7 pages

Sharesource

Time on Therapy of Automated Peritoneal Dialysis with and without Remote Patient Monitoring: A Cohort Study

BACKGROUND

- Remote patient monitoring (**RPM**) of patients undergoing automated peritoneal dialysis (**APD-RPM**) may potentially enhance time on therapy due to possible improvements in technique and patient survival

OBJECTIVES

- To evaluate the effect of **RPM** (the **Sharesource** connectivity platform) in **APD** in terms of time on PD therapy compared to **APD without RPM**

ENDPOINTS

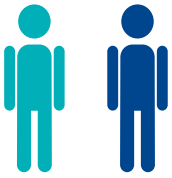
1ST **Primary outcome** was time on APD therapy

2ND **Secondary outcome** was the mortality rate over a two-year period follow-up

METHODS

Retrospective, observational, multicenter, cohort study of incident patients undergoing **APD** (defined as those receiving **APD** for more than **90 days**) at the Baxter Renal Care Services network in Colombia

The patients were divided into two cohorts according to the use of RPM, which constitutes the exposure variable:



APD-RPM cohort: patients using the **Homechoice Claria** APD system device with the **Sharesource** connectivity platform (Baxter Healthcare, Deerfield, USA)

APD-without RPM cohort: patients using APD **Homechoice** without RPM

Follow-up within the study was up to two years

An intention-to-treat approach was used according to whether the patient used a remote monitoring program at the time of the inception of the cohort (**APD-RPM**) or not (**APD-without RPM**)

Reduction of Drop Out

1474 patients

10 patients did not meet eligibility criteria

1464 eligible patients

288 APD-RPM (The Sharesource connectivity platform)

132 (45.8%) patient's early termination of the study:

Death	43 (14.9%)
Kidney transplant	15 (5.2%)
Technique failure	46 (16.0%)
Censored events	28 (9.7%)

156 (54.2%) completed follow-up

1176 APD-without RPM

746 (63.4%) patient's early termination of the study:

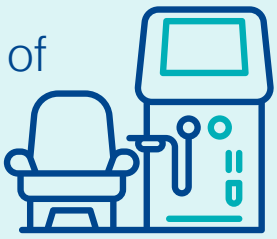
Death	229 (19.5%)
Kidney transplant	33 (2.8%)
Technique failure	163 (13.9%)
Censored events	321 (27.3%)

430 (36.6%) completed follow-up

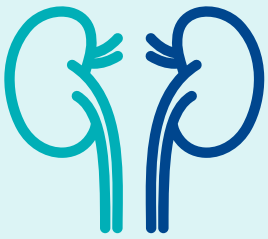
Censored events were:

Loss to follow-up

Change of dialysis provider



Recovery of kidney function



Change of **APD modality** (patients who started in the **APD without RPM** cohort and then switched to **APD with RPM**)

Propensity Score Matching (PSM):

- A propensity score matching (PSM) 1:1 without replacement utilizing the nearest neighbor within caliper (0.035) was used and created a subpopulation in which the baseline covariates were well balanced
- The propensity score for each subject was calculated from a logistic regression model that included variables as predictors of the exposure status such as age, sex, black race, diabetes history, socioeconomic level, school level, Charlson Comorbidity Index, center size, hemoglobin, phosphorus, potassium, albumin, urine output in mL/day, and censored events
- Fine & Gray multivariate analysis was performed to assess the effect of demographic, clinical, and laboratory variables on the risk of death, adjusting for competing risk events such as technique failure and kidney transplantation
- In addition, the cumulative incidence of deaths was estimated by adjusting for competing risk events, and Pepe and Mori's statistical test was used to compare the equality of the cumulative incidence functions (CIFs) by exposure status
- Inverse Probability of Treatment Weighting (IPTW) was approached using a propensity score to control differences between the groups and perform a sensitivity analysis for the direction of the observed effect

RESULTS

Full Sample:

- There were **272** death events with an overall rate of **0.13** events per patient-year
- The mortality incidence function adjusting for competing risks was:

APD-RPM group
7.1% for **1st year**
and **15.9%** in **2nd year**

APD-without RPM group
11% for **1st year**
and **23.6%** in **2nd year**

Matched sample:

- Statistically significant differences were observed in time on therapy when comparing APD-RPM with the APD-without RPM group. The time on therapy was greater for those with the **RPM program by 3.2 months**
- The APD-RPM group was associated with a lower mortality rate per patient-year, although this difference was not statistically significant. 0.10 events per patient-year in the APD-RPM group (95% CI: 0.07 to 0.13) vs. 0.12 in the APD-without RPM group (95% CI: 0.09 to 0.16), p=0.325.

Time on therapy and mortality rate in the full sample and matched sample:

	Full Sample			Matched Sample		
Outcomes	**APD with RPM n=288**	**APD without RPM n=1176**	***p* value**	**APD with RPM n=287**	**APD without RPM n=287**	***p* value**
Time on therapy, Months, mean (SD)	18.96 (7.32)	16.59 (8.04)	<0.001	18.95 (7.33)	15.75 (8.1)	<0.001
Difference, months (95% CI)	2.37 [1.35, 3.39]			3.2 [1.93, 4.46]		
Mortality, events/ person-year 95% CI	0.10 [0.07, 0.13]	0.14 [0.12, 0.16]	0.0013	0.10 [0.07, 0.13]	0.12 [0.09, 0.16]	0.325
IRR, 95% CI	0.67 [0.47, 0.93]			0.81 [0.54, 1.22]		

SD: Standard deviation, RPM: Remote patient monitoring, CI: Confidence interval, PS: Propensity score
IRR: Incidence rate ratio defined as APD-RPM/APD without

CONCLUSIONS

- Over two years of follow-up, APD patients supported by RPM with the **Sharesource** connectivity platform stayed 3.2 months longer on APD therapy compared to a matched group of APD patients without RPM
- This result indicates that RPM has the potential to improve the clinical effectiveness and the overall quality of APD therapy

Baxter's **Homechoice Claria** APD system is intended for automatic control of dialysis solution exchanges in the treatment of pediatric and adult renal failure patients undergoing peritoneal dialysis in the HOME HEALTHCARE ENVIRONMENT including comparable use in professional healthcare facilities.

The **Sharesource** portal is intended for use by healthcare professionals to remotely communicate new or modified treatment parameters with compatible dialysis instruments and transfer completed treatment data to a central database to aid in the review, analysis, and evaluation of patients' historical treatment results. This system is not intended to be a substitute for good clinical management practices, nor does its operation create decisions or treatment pathways.

Rx Only: For safe and proper use of products mentioned herein, please refer to the appropriate Instructions for Use or Operator's Manual.

US-RC42-230004 V1.0 04/23

Baxter