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Sharesource
Remote Patient Monitoring

EVIDENCE SERIES:

STUDY

Automated Remote Monitoring for Peritoneal Dialysis and its impact on Blood Pressure

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Automated Remote Monitoring for Peritoneal Dialysis
and Its Impact on Blood Pressure

BACKGROUND

> The adherence of PD patients to their treatment cannot always be monitored by physicians.

> Remote monitoring automated peritoneal dialysis (RM-APD) can affect patients' compliance with treatment and, thus, clinical outcomes.

> Remote monitoring technology integrated into APD systems makes it possible to receive patient treatment data, allowing early detection of problems and their remote resolution

OBJECTIVES

> To evaluate the clinical outcomes of patients with a remote access program.

ENDPOINTS

> Treatment adherence

> Dialysis adequacy

> Change in blood pressure control

> Sleep quality

> Health-related quality of life

METHODS

> Observational study

> 15 patients all treated with traditional APD using the **Claria** Cycler were switched to RM-APD (Claria with the Sharesource platform) and followed for a 6-month period.

> Patient data was checked in **Sharesource** daily and the following information was recorded:

1. important alarms – total number of alarms and those related to adherence were calculated per patient monthly.
2. ultrafiltration profile
3. initial drainage
4. blood pressure – recorded before the switch to RM-APD and then on a daily basis after the switch. Mean arterial blood pressure (MAB) was calculated for all patients every month and drug dose adjustment was performed.
5. body weight

> The medical outcome survey short form 36 (SF-36) was used to measure of health status and health-related quality of life at the beginning of RM-APD and at 6 months of follow-up.

> The Pittsburg Sleep Quality Index (PSQI) questionnaire was used to assess patients' sleep dysfunction at the beginning of RM-APD and at 6 months of follow-up.

> The hospital electronic medical records system was used for baseline information

> The dialysis solutions of the patients were also recorded

> The adequacy of dialysis was determined by measuring the total weekly creatinine clearance, normalized to 1.73 m^2 of the body surface area and total weekly urea clearance (Kt/V)

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RESULTS

> Statistically significant decrease in MAB (99 ± 19 vs. 89 ± 11 mm Hg, p = 0.01)

> MAB in the sixth month of the RM-APD switch was significantly lower when compared to baseline, and 3, 6 months before the device switch (p = 0.01, p = 0.01, and p = 0.03, respectively)

> Considerable increase in Kt/V in the sixth month after the RM-APD switch (2.11 ± 0.4 vs. 2.25 ± 0.5).

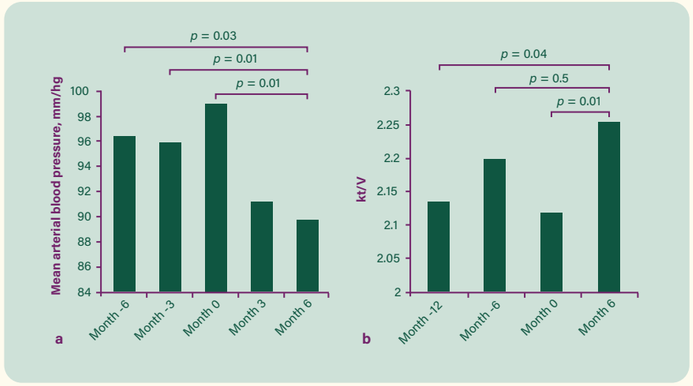

Figure 1. Comparison of mean arterial blood pressure of patients during 12 months of follow-up. Month 0 indicates the beginning of remote monitoring automated peritoneal dialysis (RM-APD). **b** Comparison of mean Kt/V of the peritoneal equilibrium test during the 18 months of follow-up. Month 0 indicates the beginning of RM-APD.

Table 1. Treatment and medical evaluation before and after RM-APD

	Before RM-APD	After RM-APD	p value
MAB, mm Hg	99±19	89±11	*0.01*
PET			
Kt/V	2.11±0.4	2.25±0.5	*0.03*
CrCl, mL/min	57 (42.8-120.3)	63.1 (46.4-141)	*0.1*
Urinary volume, mL	600 (0-2,600)	700 (0-2,400)	*0.5*
Urinary CrCl, mL/min	1.17 (0-15.8)	1.39 (0-14.3)	*0.7*
Permeability, n			
Slow	1(7%)	0	
Average	11 (73%)	11 (73%)	
Fast	3 (20%)	4 (27%)	
UF, mL			
-3 to 0 month vs. 0 to 6 months	800 (500-1,000)	824 (537-1,183)	*0.03*
-6 to 0 month vs. 0 to 6 months	752 (490-986)	824 (537-1,183)	*0.009*
Drugs			
EPO, n	8 (53%)	7 (47%)	*0.3*
Antihypertensive drug, n	10 (67%)	9 (60%)	*0.8*
Antihypertensive group	2 (0-4)	2 (0-4)	*0.3*
Antihypertensive drug count, daily	4 (0-7)	2 (0-6)	*0.05*
Phosphate binder, n	8 (53%)	8 (53%)	
Calcium-based phosphate binder, n	4 (27%)	2 (13%)	*0.3*
Sevalemer, n	5 (33%)	6 (40%)	*0.3*
Diuretic, n	10 (67%)	10 (67%)	
Total drug count, daily	11 (6-22)	8 (5-22)	*0.08*
Dialysis fluid			
Glucose weight, g/day[1]	123.87	124.9	*0.1*
Icodextrin			
n	10 (66%)	10 (66%)	
mL	1,610	1,610	

Significant increase in ultrafiltration when comparing the 3-month and 6-month amounts before RM-APD with the amount at 6-months after RM-APD (800 mL [500–1,000] and 752 mL [490–986] vs. 824 mL [537–1,183]).

Need for daily antihypertensive was medication significantly reduced 4 [0–7] vs. 2 [0–6], p = 0.05) at the sixth month of device switch compared to baseline

MAB, mean arterial pressure; PET, peritoneal equilibrium test; CrCl, creatinine clearance; UF, Ultrafiltration; daily glucose load in the 6-month period before RM-APD versus average daily glucose load in the 6-month period EPO, erythropoietin-stimulating agent; RM-APD, remote monitoring automated peritoneal dialysis. during RM-APD. Statistically significant p values are italicized.

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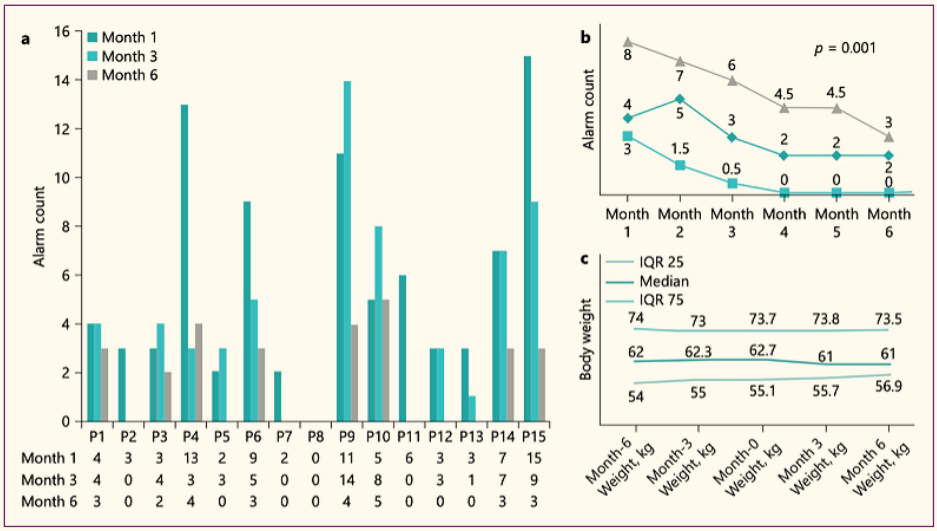

Fig. 2.a Change of important signals received during the peritoneal dialysis session. **b** Median and interquartile range (IQR) 25-75 values of the important alarms received from the device and treatment lost after remote monitoring automated peritoneal dialysis. The median number of the signal was statistically significantly between month 6 and month 1 (p=0,001). **c** Median and interquartile range (IQR) 25-75 values of the weight of the patients during the 1-year follow-up.

> Patients' treatment adherence changed after switching to RM-APD: Alarms received decreased (and treatment adherence of patients increased (from 4 [3–8] to 2 [0–3], p = 0.001).

> Patient median body weight decreased from 62.7 to 61 kg within 6 months.

NO SIGNIFICANT CHANGE IN SLEEP QUALITY AND HEALTH-RELATED QUALITY OF LIFE

BLOOD PRESSURE REGULATION ACHIEVED

Sharesource is associated with APD patients achieving significantly greater blood pressure control compared to APD alone

APD with **Sharesource** is associated with significant increase in ultrafiltration

CONCLUSIONS

> Long-term treatment adherence is an important problem in patients undergoing PD.

> Treatment non-adherence causes a decrease in dialysis efficiency and ultrafiltration and an increase in blood pressure, increasing pill burden

> With RM-APD, remote control of patients is ensured, and patients are actively kept in treatment

As a result, and dialysis of patients increase with improved treatment adherence, and blood pressure regulation can be achieved with fewer antihypertensive drugs

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For safe and proper use if products mentioned herein refer to the operator manual

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