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Peritonitis rates among Automated peritoneal dialysis patients: Underlying factors and outcomes.

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Abstract

Back ground: Peritonitis among peritoneal dialysis (PD) patients is a major impediment for patient and physician acceptance of peritoneal dialysis as an alternate to hemodialysis. We look at our peritonitis rates among Automated peritoneal dialysis (APD) patients.

Methods: All patients undergoing APD were included in the analysis since January 2025 till now and had undergone at least a month of PD. Peritonitis rate was calculated and all factors were closely evaluated.

Results: Among 82 APD patients the majority were males. A peritonitis rate was calculated to be 0.62 episodes per patient years. Single mortality among 22 patients who died, was directly attributed to severe sepsis after an episode of peritonitis.

Conclusion: The peritonitis rates are better as the experience with the PD is improving. Attention to simple infection prevention protocols and retraining of the patients will further improve the targets to international standards.

Keywords: Peritoneal dialysis; peritonitis, automated peritoneal dialysis, outcome, reinsertion.

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Introduction

For the success of any peritoneal dialysis (PD) program, one of the major criteria is the peritonitis rate of the center.[1] Peritonitis is dependent on several factors, commonly attributed factors are systematic setup of a PD center, training of the peritoneal dialysis caregivers (PDC), training conferred upon the patients, retraining and a meticulous follow up, being the most important ones. Having said that; it is acceptable for centers in their early years of development to have a higher rate of peritonitis to more than 1 per patient year, with gradual decline over the time to the standard of 0.4 episodes per patient years and more recently up to 0.2 per patient years.[2]

Peritoneal dialysis resurgence in Pakistan is being observed and in this context, it is important to look at the peritonitis rates among our PD centers. A recent study from the same group last year looked at the Peritonitis rates and found to be 0.76 per patient.[3] The aim of the current study was

to ass the current peritonitis rate in year 2025. The rationale was to assess the progress in terms of achieving the target as set by the ISPD.

Methods.

It was a retrospective analysis of all our patients who underwent Automated Peritoneal dialysis (APD) with a cycler provided by Byonyks under Omar hospital and Kidneys Beyond Borders (KBB) at Mayo hospital Lahore. The study was approved by the Institutional review board of Omar hospital Lahore vide letter OHJR-01-2025 dated 23rd December 2025.

There were 108 patients undergoing PD (both CAPD and APD) from Jan1st 2025 till dec 18, 2025. After excluding the CAPD patients, a total of 82 patients were included who were undergoing APD only. This study evaluates in detail the clinical characteristics and outcomes of these APD patients. All patients undergoing active peritoneal dialysis for ≥30 days, were included in the study.

Data regarding patient demographics, underlying cause of ESRD, number of peritonitis episodes, organisms and outcome of episodes of peritonitis were obtained from the central registry maintained at Byonyks office.

Simple descriptive analysis were obtained using SPSS (version 28, N York,USA). Peritonitis rate was calculated as per the ISPD guidelines: number of peritonitis episodes divided by the total number of patient years at risk (total number of patients at the time of study multiplied by the number of years of each patient undergoing PD.[1]

Results:

Baseline characteristics are described in table 1. Number of episodes of peritonitis and organisms are shown in table 2. Overall peritonitis rate was 0.62 per patient year. Exit site infection was rare and only 3 patients had exit site infection that was managed easily. Overall 27 patients were offboarded during the year, 15 patients died (2 deaths were attributed to severe sepsis as a result of resistant peritonitis and 14 others due to variable reasons such as cardiac and sepsis unrelated to PD). 9 patients were shifted to hemodialysis (2 related to peritonitis and other 7 due to catheter malposition or intraperitoneal adhesions). Overall, 5 patients had catheter removal, with catheter reinsertion in 2 patients and three patients were shifted to hemodialysis permanently. Clinical presentation of peritonitis is presented in table 3. Majority of the peritonitis episodes were easily managed and final outcome of peritonitis episodes are shown in table 4.

Table 1: Patient Demographics and Clinical Characteristics

Parameter	Value	Percentage
Mean Age (years)	55.9 ± 16.3	-
Gender (Male/Female)	52/30	
Total Patient-Years	45.38	-
Peritonitis Episodes	28	-
Diabetes Mellitus (DM)	10	12.2%
DM + Hypertension (HTN)	32	39%
Hypertension (HTN)	23	28%
Others	17	20.7%

Discussion:

Our peritonitis rate among APD patients is observing an improvement from 0.76 Per patient years in 2024 to 0.62 episodes per patient years in our current study. This although seems a small improvement, in fact is in a cohort of current 82 patients compared to 12 in the earlier study. This albeit a continuous improvement is still far from our goal of 0.2 episodes per patient years.[1] Being in a third world country where literacy and hygienic conditions are not great is a struggle that requires a lot of vigilance from the PDC as well as the patients. [4,5]

Table 2: Distribution of Culture Report Results

Category	Count (n)	Percentage (%)
Negative	22	78.6%
Pseudomonas	2	7.1%
Staphylococcus aureus	2	7.1%
Klebsiella pneumoniae	2	7.1%
Total	28	100%

The beauty of PD and APD is its ease and comfort with which it can be performed and that is also the reason that patients tend to forget the simple protocols of hand sanitization etc. it is for this reason training and retraining of PD patients at certain points in PD, a close follow up by the PDC team are the corner stone of a successful PD program.[6] In our patients majority of the patients having peritonitis were due to touch contamination.

Table 3: Outcomes Summary

Likely Cause	Count (n)	Percentage (%)
Touch Contamination	10	35.7%
Constipation	8	28.6%
Unknown	7	25.0%
Diarrhea	1	3.6%
Antibiotic Use	1	3.6%
Post-Operative Infection	1	3.6%
Total	28	100%

Table 4: Outcomes Summary

Category	Count (n)	Percentage (%)
Resolved	22	78.6%

Death	1	3.6%
Catheter Removal	5	17.9%
Total	28	100%

Recent studies showing a successful PD program with minimum peritonitis rates from developing countries stress on team work, patient education, retraining and close follow up with the patients.[7]

PD whether performed by APD or CAPD does not influence the peritonitis rates as mentioned in the literature.[2] We did not compare our peritonitis episodes with our CAPD cohort as numbers were small.

Majority of the peritonitis episodes were easily manageable and no significant morbidity or mortality was associated with peritonitis in our study. This is similar to the outcomes reported earlier. [7]

One of our major limitations was the culture negative peritonitis, as per guidelines the cultures were sent in blood culture bottles but majority of the time no growth was obtained 78.6%.[1]

Conclusion

In conclusion it is encouraging to see that peritonitis rates among APD patients in Pakistan are declining, nevertheless a lot more needs to be done to achieve the goal of 0.4 episodes per patient year.

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