

## Providing Optimal Care for Children on Chronic Peritoneal Dialysis during the COVID-19 Pandemic: Challenges in a Resource-Limited Setting

Dear Editor,

The coronavirus disease 2019 (COVID-19) pandemic and ensuing lockdown imposed several challenges in providing care for patients with kidney failure. Difficulty in accessing a health-care facility, procuring disposables required for peritoneal dialysis (PD), financial and logistic hardships were a few of them. The impact of these challenges on the quality of health care provided has not been well documented in children on chronic dialysis from a resource-limited setting. To understand the impact of the challenges imposed by the pandemic on the care provided during the pandemic, we studied the rate and outcome of peritonitis as benchmarks for the care. We compared the incidence and outcome of peritonitis in children on continuous ambulatory PD (CAPD) during the COVID-19 pandemic to our center's data from the previous year. This was a retrospective review of data which included children on CAPD from January 2019 to August 2021. Children with less than 3 months of follow-up and those with PD catheters inserted for acute dialysis were excluded.

The period from April 2020 to August 2021 was considered as the period of the COVID-19 pandemic (pandemic period). The preceding 18 months (from January 2019 to March 2020) were included as the control period. The incidence of peritonitis, risk factors, frequency of retraining, and home visits were compared between the two periods. The duration of hospitalization, removal and reinsertion of catheter, and technique failure were the outcomes compared between the two groups.

The study included 38 children during the pandemic period and 43 children during the control period. The demographic parameters were comparable between the two groups [Table 1]. The center's protocol for catheter insertion was followed in majority of the patients during both the time periods.

During the control period, four children (9.3%) had five episodes of peritonitis, compared to 14 episodes in 10 (26.3%) children during the pandemic period. The rate of peritonitis was significantly higher in the pandemic period (2.76/patient-months) in comparison to the control period (0.8/patient-month) [Table 2]. The risk factors for peritonitis, rate of relapsing peritonitis, and fungal peritonitis were comparable between the two periods.

The median (inter-quartile range (IQR) number of outpatient visits in the pandemic period (2 [1, 4]) was significantly lower than during the control period (4 [1, 6]) ( $P = 0.04$ ). The number of retraining sessions was lower in the pandemic period (1 [0, 3]) when compared to

the control period (2 [0, 4]) but was not statistically significant ( $P = 0.07$ ). Five home visits were conducted during the control period, while none were conducted during the pandemic.

During the control period, two (40%) children required reinsertion of catheter for relapsing peritonitis and cuff extrusion and one (20%) child required change to hemodialysis due to fungal peritonitis. Two children switched to hemodialysis for logistic reasons, two underwent renal transplantation, and two children died due to causes other than peritonitis. There was no loss to follow-up. During the pandemic period, three (33%) children required removal of catheter for fungal peritonitis and switched to hemodialysis and three (33%) required catheter reinsertion for cuff extrusion. Four children underwent renal transplantation, eight were lost to follow-up, and two children died due to causes other than peritonitis.

We found a higher rate of peritonitis among children during the COVID 19 pandemic compared to the previous year. There was a reduction in the number of outpatient visits, retraining sessions, and home visits during this period. A previously published study from our center

**Table 1: Comparison of the demographic details of the cohort on peritoneal dialysis during the pandemic period and the control period**

Parameters	Control period (n=43)	Pandemic period (n=38)	P
Age (years) <sup>a</sup>	11 (9, 13.5) years	11 (9, 13)	0.59
Sex (females)	14 (32.5%)	15 (39.8%)	0.67
Etiology of CKD			
CAKUT	11 (25.5%)	11 (28.9%)	
FSGS	10 (23.2%)	11 (28.9%)	
Obstructive uropathy	4 (9.3%)	1 (2.6%)	
Duration of dialysis <sup>a</sup> (months)	24 (12.5, 36.2)	20 (12, 32.1)	0.67
Newly initiated on dialysis <sup>b</sup>	5 (11.6%)	5 (13.1%)	0.89
Number of days of training for newly initiated <sup>a</sup>	12.2 (11, 14)	10.9 (9, 12)	0.07
Catheter details <sup>b</sup>			
Double cuff	42 (97.6%)	37 (97.3%)	0.53
Downward/lateral exit site	42 (97.6%)	37 (97.3%)	0.53

<sup>a</sup>All continuous variables are expressed as median and standard deviation. <sup>b</sup>All categorical variables are expressed as numbers and percentages. CAKUT – Congenital anomalies of the kidney and urinary tract; FSGS – Focal segmental glomerulosclerosis

**Table 2: Comparison of peritonitis rates, risk factors and outcomes between the two groups**

Parameters	Control period (n=5)	Pandemic period (n=14)	P
Rate of peritonitis (episodes/patient-month)	0.8	2.76	0.002
Organisms			
Gram positive	2	1	0.52
Gram negative	1	3	0.56
Culture negative	1 (20%)	7 (50%)	
Fungal	1 (20%)	3 (21.4%)	
Risk factors			
Cuff extrusion	2 (40%)	3 (21.4%)	0.82
Touch contamination	1	1	
Change of caregiver	0	1	
Relapsing peritonitis	1 (20%)	4 (28.5%)	0.82
Number of outpatient visits	4 (1, 6)	2 (1, 4)	0.04
Retraining sessions	2 (0, 4)	1 (0, 3)	0.07
Number of home visits	5	0	
Complete resolution	4 (80%)	11 (78.5%)	0.82
Reinsertion of catheter	2 (40%)	3 (14.3%)	0.78
Switch to hemodialysis	1 (20%)	3 (21.3%)	0.81

showed that most children on PD stay a long distance from the hospital.<sup>[1]</sup> In addition, during the pandemic, there were other factors that influenced the care provided. Data from adults showed that there was an increase in initiation of PD during the pandemic when compared to previous years,<sup>[2]</sup> with no increase in peritonitis. Several centers across the world switched to telehealth facilities for remote monitoring of patients on PD<sup>[3,4]</sup> and found that there was no increase in peritonitis rates.<sup>[4]</sup> A survey of the Standardising Care to improve Outcomes in Pediatric End-stage kidney disease (SCOPE) centers showed that both health-care providers and caregivers found that telehealth was a feasible mode to monitor children on PD.<sup>[5]</sup> In resource-limited countries, where telehealth facilities are not available/easily accessible, remote monitoring is a challenge. This is supported by the International Society of Nephrology- Dialysis Outcomes and Practice Patterns Study (ISN-DOPPS) study, which reported major disruptions in PD supplies in resource-limited regions.<sup>[6]</sup> Our study, though limited by the small numbers and the retrospective study design, highlights the challenges of providing optimal care to children with chronic kidney disease (CKD). Establishment of sustainable and accessible telehealth services is essential to maintain remote monitoring of patients in resource-limited regions.

#### Financial support and sponsorship

Nil.

#### Conflicts of interest

There are no conflicts of interest.

**Nivedita Kamath, Swathi Kiran Shiri,  
Arpana Iyengar**

Department of Pediatric Nephrology, St. John's Medical College Hospital,  
Bangalore, Karnataka, India

#### Address for correspondence:

Dr. Nivedita Kamath,  
Department of Pediatric Nephrology, St. John's Medical College Hospital,  
Sarjapura Road, Koramangala, Bangalore – 560 034, Karnataka, India.  
E-mail: nkamath25@yahoo.com

#### References

- Kamath N, Reddy HV, Iyengar A. Clinical and dialysis outcomes of manual chronic peritoneal dialysis in low-body-weight children from a low-to-middle-income country. *Perit Dial Int* 2020;40:6-11.
- Canney M, Er L, Antonsen J, Copland M, Singh RS, Levin A. Maintaining the uptake of peritoneal dialysis during the COVID-19 pandemic: A research letter. *Can J Kidney Health Dis* 2021;8:2054358120986265.
- Polanco E, Aquey M, Collado J, Campos E, Guzman J, Cuevas-Budhart MA, *et al.* A COVID-19 pandemic-specific, structured care process for peritoneal dialysis patients facilitated by telemedicine: Therapy continuity, prevention, and complications management. *Ther Apher Dial* 2021;25:970-8.
- Wang Z, Yan W, Lu Y, Song K, Shen H, Wang Y, *et al.* Effect of combining conventional and telehealth methods on managing peritoneal dialysis patients: A retrospective single-center study. *Int J Clin Pract* 2022;2022:6524717.
- Clark SL, Begin B, De Souza HG, Mallett K, Hanna MG, Richardson T, *et al.* Telehealth survey of providers and caregivers of children on peritoneal dialysis during the COVID-19 pandemic. *Pediatr Nephrol* 2023;38:203-10.
- Albahr R, Bieber B, Aylward R, Caskey FJ, Dreyer G, Evans R, *et al.* An ISN-DOPPS survey of the global impact of the COVID-19 pandemic on peritoneal dialysis services. *Kidney Int Rep* 2022;7:2196-206.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> <a href="https://journals.lww.com/ijon">https://journals.lww.com/ijon</a>
	<b>DOI:</b> 10.4103/ijon.ijn_368_22

**How to cite this article:** Kamath N, Shiri SK, Iyengar A. Providing optimal care for children on chronic peritoneal dialysis during the COVID-19 pandemic: Challenges in a resource-limited setting. *Indian J Nephrol* 2023;33:404-5.

Received: 17-11-2022; Accepted: 31-01-2023; Published: 20-03-2023

© 2023 Indian Journal of Nephrology | Published by Wolters Kluwer - Medknow