



ISPD Asia-Pacific Chapter Newsletter, April 2021

VOLUME 19, ISSUE 1

Chapter News

ISPD APC meeting 2023

We are proud to announce the 11th Asia Pacific Chapter Meeting of the International Society of Peritoneal Dialysis will be hosted by The Peritoneal Dialysis Society of India on 22-24 September 2023. The details of the arrangement will follow.

Scholarship

We have refined the criteria for the ISPD Asia-Pacific Chapter Scholarship. Please refer to a separate session of this newsletter.

Prepared by: CC Szeto, Coordinator, ISPD Asia Pacific Chapter

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This is a scholarship to support up to 3 months training in clinical PD for doctors and nurses from Asia-Pacific region. Deadline for application for each round: twice a year at 30 June or 31 December. **The next deadline is 30 June 2021.** Details and application procedures can be found under the Regional Chapters – Asia-Pacific Chapter, at the ISPD website.

18-22 August 2021

Pattaya, Thailand

Registration open: 27 February 2021

Deadline of abstract submission: 15 April 2021

Website: <http://www.apcn2021.com/>

International Society for Peritoneal Dialysis 2022 Congress

14-17 May 2022

Suntec, Singapore

Abstract Deadline: 1 February 2022

Early Registration: 29 April 2022

Website: <https://ispd2022.com/>

ISN World Congress of Nephrology 2022

24-27 February 2022

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Abstract submission open: 15 April 2021

Abstract submission deadline: 22 September 2021

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Guideline Update

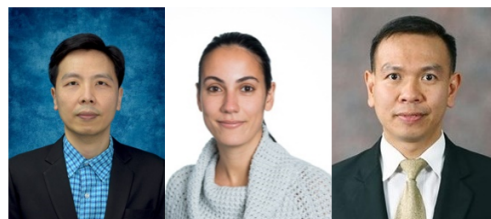
Meaningful Peritoneal Dialysis Core Outcomes: A summary from the SONG-PD (Standardized Outcomes

in Nephrology-Peritoneal Dialysis) Initiative

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Compared with hemodialysis (HD), peritoneal dialysis (PD) offers lower healthcare costs, more self-autonomy, simplicity, and flexibility. Still, challenges to successful PD need overcome, for instance, peritonitis, technique failure, and patient and caregiver exhaustion. In this light, numerous randomized controlled trials have been conducted aiming to improve PD longevity. Nonetheless, decisions cannot be informed because outcomes reported in the literature are heterogeneous, inconsistently measured, and not patient-focused. Without a standardized outcome measurement, comparing the effects of interventions across trials cannot be done. Besides, many trials do not address problems of relevance to end-users of the research. To tackle these issues, the Standardized Outcomes in Nephrology (SONG)-PD initiative commenced in 2016 to establish a core outcome set for trials in PD based on the shared priorities of patients, caregivers, clinicians, researchers, policymakers, and industrial representatives. This helps ensure that research measures and reports meaningful and relevant outcomes to patients with PD, their family, and their clinicians.

Study processes

The study methodology comprised structurally five phases (Figure 1). Phase 1 involved a comprehensive literature search of RCTs, recruiting PD patients aged ≥ 18

years during 2011-2016. Interventions of any kind employed to treat and manage the patients were included. In phase 2, patients aged ≥ 18 years currently receiving PD and their caregivers were invited to identify outcomes that they considered essential and relevant for trials. Focus groups were conducted using the nominal group technique to quantify the relative importance of outcomes. Semi-structured key informant interviews were carried out in phase 3. Internationally, health professionals involved in PD patients' care were recruited for face-to-face or online interviews if an in-person arrangement was not feasible.

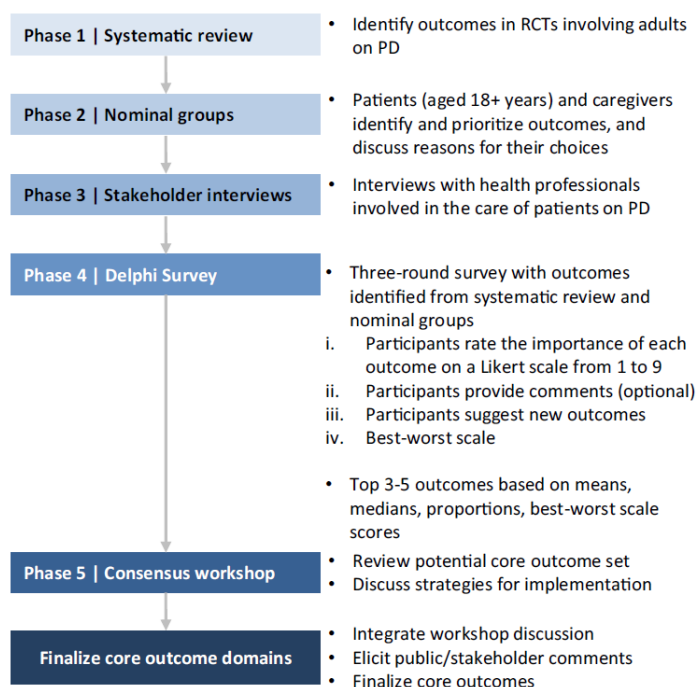


Figure 1. SONG-PD phases (taken from Manera KE, et al. Establishing a Core Outcome Set for Peritoneal Dialysis: Report of the SONG-PD (Standardized Outcomes in Nephrology–Peritoneal Dialysis) Consensus Workshop. *Am J Kidney Dis.* 2020;75(3) 404 - 412)

In phase 4, an online 3-round Delphi consensus survey was conducted to derive three to five core outcome domains significant and meaningful to all stakeholders. Rating each outcome domain was done using the 9-point Likert scale, and additional comments could be optionally made in each round. The final phase was a consensus workshop, convened at the International Society of Peritoneal Dialysis conference in 2018 in Canada, with such objectives as to review the results obtained through the previous four phases and discuss the potential core outcome domains (Figure 1). A total of 70 participants attended, including 19 patients/caregivers with PD experience and 51 health professionals from 13 countries, such as physicians, surgeons, researchers, and policymakers, possessing a wide range of expertise and clinical nephrology research experience.

Key Findings

Identification of the core outcome domains and considerations for implementation were the key findings of the study. A core outcome set was an agreed standardized set of outcomes that should be measured and reported, as a minimum, in all clinical trials in specific areas of health or health care. Core outcomes set should be included based on importance (critical to patients even if there is no difference), be feasible to implement, and not have to be the primary outcome (Figure 2). The set is categorized into three tiers: 1) inner tier (core outcome) defined as the outcomes that are critically important to all stakeholder groups and reported in all trials, 2) middle tier is critically important to some stakeholder groups and reported in some trials, and 3) outer tier is important to some or all stakeholder groups and considered for trials (Figure 3).

Best Worst Scale Survey

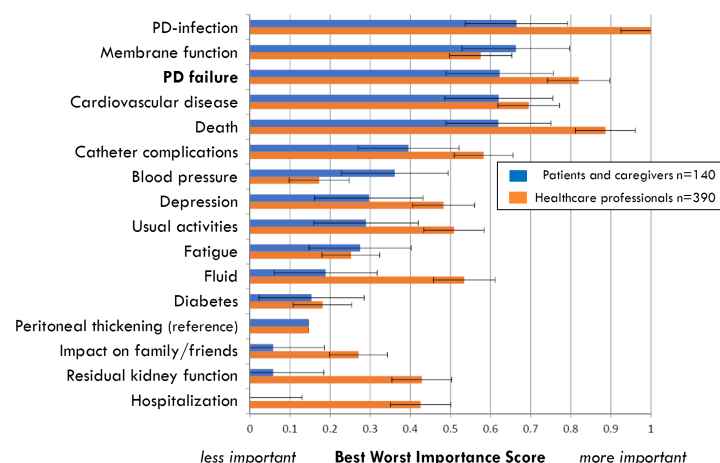


Figure 2. Best worst scale survey (taken from Manera KE, et al. An international Delphi survey helped develop consensus-based core outcome domains for trials in peritoneal dialysis. *Kidney Int.* 2019;96(3):699-710.)

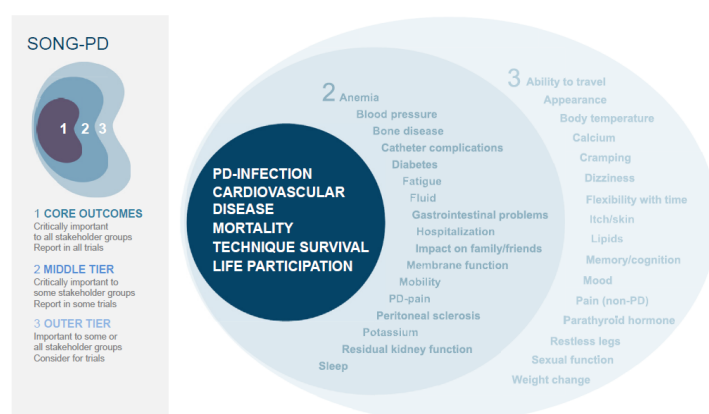


Figure 3. Standardized Outcomes in Nephrology-Peritoneal Dialysis (SONG-PD) core outcome domains. (taken from Manera KE, et al. Establishing a Core Outcome Set for Peritoneal Dialysis: Report of the SONG-PD (Standardized Outcomes in Nephrology-Peritoneal Dialysis) Consensus Workshop. *Am J Kidney Dis.* 2020;75(3) 404 - 412)

Life participation was identified by patients as a primary goal of PD, as PD is a home-based therapy and promotes autonomy and flexibility in daily living. Patients also considered the ability to participate in daily activities without major restrictions or limitations from the therapy to be an indicator of treatment success. Thus, life participation was prioritized as a core outcome. Fatigue was a patient-reported outcome which placed in the middle tier, as it was recognized by the patients/caregivers as one of the major factors affecting life participation. In this sense, not only physical but also mental fatigue were documented. However, other factors, including repetitive daily exchanges, might also affect life participation. Another topic mentioned in the discussion was empowerment. Patients stated that being consistently informed about the process would keep them on track and prepared for potential PD complications. Although membrane function and catheter-related complications were known as PD technique failure contributors, both were not included as a core outcome domain since they did not necessarily lead to permanent PD technique failure. Of note, the panel recommended using positive terminology and avoiding pejorative words or phrasing, i.e., PD failure. Thus, positive alternatives were recommended, including "technique survival" and 'modality transitions."

Concerning the implementation of the core outcomes, particularly the outcome with subjectivity, "life participation," the following elements were elaborated by the panel: patient-reported outcome standardization, the requirement of validated and feasible measures, simplicity of binary outcomes, intervention responsiveness, and use of positive terminology. Firstly, participants agreed that "life participation" needed to be standardized because several factors, namely, subjective perception, cultural differences, and individual preference, could influence this outcome in varying degrees. Secondly, measurement of 'life participation" needed to be identified and validated since the existing tool that measured similar concepts (e.g., quality of life) was not easily manageable, containing many questions and various kinds of questionnaires. Moreover, the tool did not accurately capture life participation, and the scores did not demonstrate change. The ideal tool measurement should be made less complicated, more manageable, reducible, and user-friendly. Thirdly, outcome measurement in a binary way would be easier to identify and understand, such as 'yes' or 'no' for death. Lastly, the outcome should be clinically relevant and meaningful. Although the study remarked that no validated measures for life participation had been available for PD situations, the panel did not consider that existing measures were suitable. A recent systematic review from the SONG-PD Initiative has shown that there are no existing measures for life participation with sufficient validation data in the PD population. The authors proposed further work to

develop and validate potential measures to ensure appropriate use in the PD population.

In conclusion, the SONG-PD process established 5 core PD outcomes (PD-related infection, cardiovascular disease, mortality, technique survival, and life participation) that should be reported in all trials in patients receiving PD, regardless of the intervention, to ensure the study outcomes are relevant and important to patients, families, and clinicians.

Related readings

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Innovation and Technology in PD

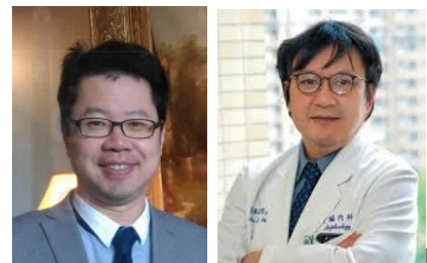
Innovations in peritoneal dialysis solutions

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As one of the major home-based dialysis modalities for end-stage kidney disease (ESKD) patients across the globe, peritoneal dialysis (PD) relies on frequent exchanges of PD solutions to achieve adequate uremic toxin clearance and excess body fluid removal. Here, we would like to highlight recent advances in PD solutions:

Innovative PD solution generation system

Given the large volumes of dialysate required and plenty of plastic/fluid waste generated during PD therapy, the environmental impact is likely to be substantial. Hence, a more ecologically sustainable system should be considered to simplify the water purification processes and reduce carbon footprint derived from the manufactory process and during the transportation of dialysate packages [1,2]. Recently, the Ellen Medical Devices (Australia) has successfully developed a portable PD-based system which has a miniature distiller, running on solar power to generate medical grade sterile water from any source [3]. It has been designed to produce point-of-care dialysate by mixing the concentrate with the purified water. Similarly, Baxter International Inc. has developed an on-demand PD solution generation technology that utilizes a small water filtration device and concentrates to turn the locally supplied tap water into PD dialysate ready for use [4]. Importantly, through Baxter's Sharesource remote patient management system, this innovative system will become more flexible for PD prescription to meet individual patient need, for example, timely titrating the dextrose concentration to reach the ultrafiltration target. Baxter has already launched its first clinical trial in the U.S in 2019. It would be crucial to demonstrate its efficacy, safety as well as provide quality assurance. Overall, the two innovative PD solution generation systems will provide affordable and accessible dialysis treatment, drastically reducing the costs, storage requirement and environmental impact. It is anticipated that these technology advances will increase global PD utilization once available in the market for the routine care.

Novel compositions of PD solutions

The use of conventional glucose-based, low pH PD solutions has long been a major concern for patients on maintenance PD therapy due to its cytotoxic effects on peritoneal membrane integrity leading to peritoneal fibrosis and ultrafiltration failure, as well as systemic metabolic side effects. For decades, clinicians and scientists have been exploring alternative PD solutions which fulfil glucose-sparing strategy without compromising the ultrafiltration efficacy. Surprisingly, very limited PD solutions have been successfully commercialized to date, hinting the challenge in the development

of new effective and safe solutions. Currently available glucose-free PD solutions such as Baxter's Extraneal (icodextrin 7.5%) and Nutrineal (amino acids 1.1%) have been widely accepted as common PD regimen now. Accumulated evidence has shown their beneficial effects related to prolonged technique survival and improved metabolic profiles. Apart from them, several alternative osmotic agents are now under investigation, such as glycerol, taurine, hyperbranched polyglycerol, low polydispersity glucose polymer. Despite some encouraging preliminary results from pre-clinical studies, caution must be taken when applying to ESKD patients especially safety concerns. Recently, an "osmo-metabolic" approach has been proposed to formulate novel PD solutions, in which the alternative ingredients with favourable osmotic and metabolic properties could possibly diminish systemic metabolic derangement and achieve better fluid removal [5]. L-carnitine and xylitol represent two such candidate agents of great interest. Both have demonstrated lower cytotoxicity *in vitro*, better metabolic profiles *in vivo* with non-inferior ultrafiltration capacity, compared to standard glucose solutions. Currently, two clinical trials based on the combination of L-carnitine, xylitol and low glucose are under investigation: the FIRST trial (NCT04001036) and the ELIXIR trial (NCT03994471). Finally, in the recent ISPD-EuroPD virtual conference, Opterion Health AG (Switzerland) presented their preliminary results of Opt100, a new osmotic driver composed of short glucose polymer (decadextrin) and maltose, showing better ultrafiltration efficacy than glucose and icodextrin-based solutions in animal models [6]. Further study will be conducted to examine its toxicology, small solute clearance, and metabolic/inflammatory impacts.

In summary, recent innovations in on-site PD solution generation technology and new osmotically active composition of PD solution have shed light on the next generation PD therapy which would hopefully improve the survival and quality of life of PD patients.

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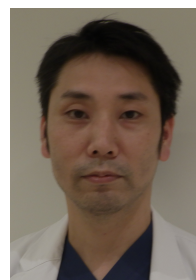
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Research News from Asia-Pacific Region

Automated peritoneal dialysis using hypertonic glucose dialysate for an elderly patient with refractory heart failure

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Refractory heart failure is a major cause of mortality and hospitalization that incurs high healthcare costs. Diuretic resistance is a powerful predictor of poor outcome in acute heart failure and is more frequent in chronic kidney disease patients [1]. An alternative strategy in refractory heart failure is ultrafiltration such as hemodialysis, continuous renal replacement therapy (CRRT), and peritoneal dialysis (PD). The advantages of PD for heart failure are its continuous nature and a greater physiological removal of extracellular fluid with stable hemodynamics. A previous systematic review suggested that PD might be an effective therapeutic option for

improving cardiac function and weight control in patients with refractory congestive heart failure [2].

Our case was an 84-year-old woman developed heart failure due to severe mitral regurgitation with a low left ventricular ejection fraction of 30%, and also developed progressive kidney deterioration. She had been refractory to diuretics and repeatedly hospitalized. She was re-hospitalized to initiate PD for refractory congestive heart failure and severe kidney deterioration. PD was chosen because her cardiac function was too low to allow vascular access. Since it was difficult for her to change the dialysis bags by herself, assistance with her PD from her family was needed. To reduce the effort required from her family members, automated peritoneal dialysis (APD) with 1.5% glucose PD fluid was started. As a result of PD, her dyspnea and edema were gradually ameliorated. Her weight decreased from 38.7 kg to 30.5 kg and her BNP level also decreased from 2416 pg/ml to 1826 pg/ml.

On day 30 of admission, atrial fibrillation tachycardia occurred and she developed congestive heart failure again without weight gain. By receiving CRRT, her weight dropped to 26 kg. Although her hemodynamics became relatively stable, her urine volume reached the level of anuria. Continuous cycling PD (CCPD) was started with 2.5% glucose PD fluid and 7.5% icodextrin solution on day 35. Ultrafiltration by CCPD was about 400 ml and was insufficient to control volume status. In order to treat PD only, the glucose concentration of APD was increased from 2.5% to 4.25% on day 48. Ultrafiltration by APD using 4.25% glucose dialysate reached 800 ml. Thereafter, her volume status was well controlled, and she was discharged on day 60.

She had no congestive heart failure episodes or encapsulating peritoneal sclerosis (EPS) symptoms up to about 30 months after PD started. In addition, APD using 4.25% glucose dialysate enabled her family to get a break from the PD procedures once every 4 days.

The use of 4.25% glucose dialysate led to a very high peak of ultrafiltration compared to that of 2.5%. In contrast, the ultrafiltration profile of 7.5% icodextrin showed a sustained gradual increase without the early peak [3]. From these results, the use of 4.25% glucose dialysate enables the most effective ultrafiltration in APD treatment. Although high glucose dialysate enables a large amount of ultrafiltration, the use of hypertonic glucose dialysate has been avoided because high glucose exposure can lead to peritoneal damage. In basic studies, high glucose is known to induce the epithelial-to-mesenchymal transition of peritoneal mesothelial cells. The early use of hypertonic glucose exchanges is associated with an increase in solute transport and earlier loss of residual renal function [4]. The early use of hypertonic glucose exchanges is associated with an increase in solute transport and earlier loss of

residual renal function [5]. In Japan, only 37.5% of patients used 2.5% glucose dialysate [6], and the peritoneal dialysis outcomes and practice patterns study (PDOPPS) revealed that 4.25% glucose dialysate was not used at all, despite around 40% of patients having used it in the US [7]. This lower use of high glucose dialysate was affected by the outbreak of EPS in the 1980s and 1990s and by the use of combination therapy of PD and HD.

Table 1. APD using hypertonic glucose dialysate for heart failure.

	Case 1	Case 2	Case 3
Age at PD start	84	81	84
Cardiovascular disease	Severe MR, Af	OMI	Post AVR, MVR, Af
Assisted-PD	Yes	Yes	No
Glucose Dialysate (%)	4.25%	2.5%	2.5%
Before PD			
Body Weight (kg)	38.6	53.9	58.3
Alb (g/dL)	2.4	2.7	2.4
BNP (pg/ml)	2416	4472	401
LVEF (%)	25	33	62
Hospitalization for heart failure (times/year)	3	1	2
1 year after PD start			
Body Weight (kg)	28	53.3	56.9
Alb (g/dL)	2.8	3.3	2.8
BNP (pg/ml)	139	156	349
LVEF (%)	30	25	57
Hospitalization for heart failure (times/year)	0	0	0
Peritonitis	0	0	0
EPS	No	No	No

In this case, there were some advantages other than volume control regarding the use of hypertonic glucose dialysate. At first, the glucose absorption from hypertonic glucose dialysate offers a nutritional advantage to the elderly who are unable to meet their energy requirements through diet alone. At second, hypertonic glucose dialysate enables a reduction in the number of dialysate exchanges. In family-assisted PD, reducing family effort is a crucial issue for sustainable treatment. In this case, we chose assisted automated PD using 4.25% glucose dialysate, which gave the patient and her family on occasional break from PD and reduced the overall family effort.

There is no general consensus as to the best dialysis modality for elderly patients with end-stage renal disease. The improvement of PD dialysate, with characteristics such as low-glucose degradation products (GDP) and neutral solution, decreases the incidence of EPS [8]. For the present case, the aim of management was to reduce hospitalization due to heart failure, to allow her to stay at home with her family. In our hospital, there are several elderly PD patients with heart failure who treat APD using hypertonic glucose dialysate with family assistance. None of them developed EPS and volume overload. We believe that hypertonic glucose dialysate is an effective choice for refractory heart failure in the elderly.

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Pilot study on using chlorhexidine swabstick as treatment for peritoneal dialysis catheter exit-site granulomas

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Introduction

In Hong Kong, the usual treatment for peritoneal dialysis (PD) catheter exit-site granulomas is to cauterise with 95% silver nitrate (AgNO₃) caustic pencil. AgNO₃ is corrosive due to its caustic effect which chemically burns the cells of granulomas. Therefore, it may also damage the normal skin and cause burning sensation and discomfort if AgNO₃ leaks to the surrounding area [1]. The introduction of 2% aqueous chlorhexidine (CHG) swabstick in our centres was initially the treatment of exit-site infection (ESI) instead of granulomas. However, we observed that granulomas shrank and disappeared after the use of CHG swabstick in 2 PD patients without adverse effects (Figure 1a-c). Therefore, we performed a case series study on 15 PD patients with exit-site granulomas between April and August 2015. Majority of the patients (n=11; 73.3%) showed good response to CHG swabstick with granulomas subsided from 3 to 28 days (mean: 13.2 days) [2].

As there is limited evidence to illustrate the effectiveness of non-invasive treatments, we conducted a pilot study at the renal centres of two public hospitals from

September 2015 to January 2019 [3] to evaluate the feasibility and efficacy of CHG swabstick for exit-site granuloma management. The detail of the study design and results were published in an international referee journal [3]. The aim of this article is to provide a brief report of this pilot study.

Pilot Study

In this pilot study, 44 patients were recruited and randomised into the study or comparison groups (1:1). In the study group, patients or carers were instructed to use CHG swabstick with 'back and forth scrubbing technique' [4] to cleanse their exit-sites daily at home up to 5 weeks. The granuloma would be treated with AgNO₃ if its size did not reduce by the end of week 5. In the comparison group, granulomas were cauterized using 95% AgNO₃ caustic pencils with the application of soft paraffin cream to protect the surrounding skin. Wound dressing was then applied and kept intact for 24 hours. This procedure was performed during patients' first visit to the nurse clinic by an experienced renal nurse. The granulomas were reviewed three and/or five days later in the nurse clinic to determine if extra doses of AgNO₃ were required. All patients were followed for six weeks for data collection.

To evaluate the therapeutic effects, time of granuloma subsidence was recorded. The renal nurse assessed the granuloma in each nurse clinic visit and took clinical photos. In addition, episodes of ESI or tunnel infection [5] and adverse effects were observed and documented. These adverse effects included skin reactions (i.e., burning and staining) and pain (self-report using the Numeric Rating Scale [6]). We also designed a patient satisfaction form to evaluate patients' experiences of the treatment, health education, and nursing assessment after the completion of treatment and care. Statistical tests (e.g., descriptive statistics, independent sample t-test, survival analysis) were used to compare the outcomes.

Findings

Twenty-two patients were allocated into each group after randomisation. Among them, 5 patients (study group n=4; comparison group n=1) were excluded from the study because of ESI. The incidence rates of ESI in the study and comparison groups were 18.2% and 4.5% respectively and were not statistically different ($p=0.16$).

Similar success rates were found in both group ($p=0.46$). All granulomas eventually subsided after AgNO₃ application (n=21; 100%) in the comparison group. In the study group, 21 patients had their granulomas removed and 4 patients received additional AgNO₃ in weeks 4 to 5 because of the persistence of exuberant granulomas. Based on intention-to-treat principle, the success rate of CHG swabstick

was 94.4%. However, we observed a significantly longer time of granuloma subsidence in the study group ($p=0.02$). The mean time of subsidence was 32.8 ± 3.7 days in the study group, whereas 12.3 ± 3.4 days were used with 2.1 doses of AgNO₃ on average in the comparison group.

We also observed fewer adverse effects in the study group. Patients using CHG swabsticks reported less burning and staining around exit-site (11.1% vs. 52.4%, $p=0.01$) and lower pain (0.5 ± 1.3 vs. 2.4 ± 1.9 out of 11, $p<0.01$) compared with those underwent AgNO₃ cauterisation. Regarding patient satisfaction, both groups showed similarly positive attitude toward the treatments received (all $p>0.1$). The mean ratings for most items were >3.0 (out of 5) that indicated an overall satisfaction with the treatment, nursing care and education. However, patients in the comparison group rated 2.7 ± 1.1 for the item about pain which implied a worse experience of pain during the AgNO₃ treatment.

Figure 1a. Large granuloma from 6 – 1 o'clock ~9 x 10 mm with dried blood clots over exit-site on day one



Figure 1b. Granuloma gradually reduced in size from 6 – 12 o'clock ~7 x 10 mm one week after application of 2% chlorhexidine swabstick



Figure 1c. Subsidence of granuloma 7 weeks after application of 2% chlorhexidine swabstick



Conclusion

Because the usual AgNO₃ treatment requires application by experienced renal nurses and has possible adverse effects, CHG swabstick may be an alternative, non-invasive and home-based management for PD catheter exit-site granulomas.

Although it takes a longer time to remove the granulomas, it causes fewer adverse effects (i.e., pain and discomfort) than AgNO₃ cauterisation. Patients are empowered to treat their granulomas at home with similar outcomes and lower cost associated with nurse clinic visit. Moreover, we found that patients showed their appreciation of nursing assessment and patient education regardless of the group assignment. Indeed, renal nurses play a vital role in assessing and educating our patients for better exit-site care and granuloma prevention. Finally, this pilot study enlightens the importance of nurse-led clinical research that transforms our clinical observation and experience into evidence-based practice.

Funding information

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The prevalence and implications of cognitive impairment in PD patients

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In peritoneal dialysis (PD) patients, the treatment goals should be good mental health, maintenance of fluid status, nutritional support, and removal of toxins [1]. Cognition is an important facet of mental health. Cognition comprises multiple domains including learning, short- and long-term memory, attention, language, social cognition (e.g., the processing of emotion-laden stimuli), perceptual-motor function, and executive function (e.g., thinking and decision-making). Self-care is important among PD patients, including to perform an exchange and examining the exit site every day. Cognitive functions, including memory, attention, and executive function, are also important in PD patients. We evaluated the associations of fluid status and toxin removal with cognitive function, which are all key outcomes in PD patients [2].

Our cross-sectional study included 59 PD patients, with a mean age of 46 ± 12 years and mean PD vintage of 59.5 ± 33.5 months. Fluid status was measured with a body composition monitor (FMC, Bad Homburg, Germany), and toxin removal was indexed by total Kt/Vurea. The Wisconsin Card Sorting Test (WCST) was used to measure executive function. The Hopkins Verbal Learning Test was used to assess language, learning and memory. Short-term memory, mental agility, and visual-motor coordination abilities were measured with the Digit Symbol Substitution Test.

Small solute clearance, reflected in the total Kt/Vurea, was not significantly correlated with executive function, but showed a trend toward a positive correlation with the WCST variable "categories achieved" ($r = -0.25$, $p = 0.07$) and a negative correlation with "trials to complete first category" ($r = -0.24$, $p = 0.08$). The PD patients with a higher small solute clearance rate tended to have better executive function than those with a lower clearance rate, but the difference was not significant.

Overhydration was negatively correlated with categories achieved ($r = -0.32$, $p = 0.02$) and positively correlated with trials to complete first category ($r = 0.31$, $p = 0.02$). (Table) Positive fluid status was significantly associated with cognitive impairment.

Table. Correlation between cognition and overhydration (N=59) in PD patients

Age, education, and depression were controlled as covariates. * $p < 0.05$.

RelOH: relative overhydration, HVL: Hopkins Verbal Learning Test, WMS: Wechsler Memory Scale

Assess	Test		r	p
Verbal memory	Hopkins Verbal Learning Test	HVLT input	0.06	0.64
		HVLT delay	-0.02	0.87
		HVLT total	0.03	0.83
Visual motor coordination	Digit Symbol Substitution Test	Symbol coding	-0.24	0.07
Working memory		WMS spatial span	0.11	0.41
Executive function	Wisconsin Card Sorting Test	Categories achieved	-0.32	0.02*
		Trials to complete first category	0.31	0.02*
		Total errors T	-0.20	0.15
		Perseverative responses T	-0.18	0.18
		Perseverative errors T	-0.15	0.28
		Nonperseverative errors T	-0.14	0.32
		Conceptual level response T	-0.20	0.15

Chronic kidney disease (CKD) patients have worse executive function and memory across glomerular filtration stages [3]. Advanced CKD patients with cognitive impairment used PD therapy less frequently at the transition to dialysis [4]. After initiating dialysis, the prevalence of cognitive impairment declines slightly [5].

An Asian study including 458 PD patients reported a executive dysfunction prevalence of 28.4%; the mean age of those patients was 52.1 ± 14.2 years and the median PD vintage was 26.5 months [6]. A study including 173 PD patients (mean age of 55.5 ± 12.2 years and median PD vintage of 25.8 months) reported that the prevalence of executive dysfunction was 26.3% [7]. These findings indicate that the prevalence of cognitive impairment differs by age, dialysis vintage, and instrument.

In a European study, the prevalence of cognitive impairment in PD patients (mean age of 56.5 years and dialysis vintage of 56.5 years) was reported as 15%, compared with 29% in hemodialysis (HD) patients. At the 1-year follow-up, the prevalence of cognitive impairment was lower in the PD than HD patients (13% vs. 19%), and the overall rate of cognitive impairment tended to decrease over time [5].

In our PD patients, fluid overload was associated with cognitive impairment. Overhydration in PD patients occurs frequently and is a risk factor for peritonitis and ultrafiltration failure [8]. Cognitive impairment and overhydration are independent risk factors for mortality [3, 8]. The mechanism underlying the association of

overhydration with cognitive impairment is not known. Second, small solute clearance, as indicated by the Kt/Vurea or creatinine clearance value, was not associated with cognitive function, similar to a previous study [9]. In that study, middle molecule clearance, indexed by the beta-2 microglobulin level but not the serum beta-2 microglobulin level, predicted improved general cognitive function at the 2-year follow-up [9].

In summary, overhydration of PD patients was associated with cognitive impairment. Patients with higher small solute clearance rates tended to have better cognitive function than those with a lower clearance rate, but the difference was not significant. Several factors, including vascular disease, uremic neurotoxicity, and the risks associated with dialysis suggested in HD, but are still uncertain [10]. Current data are insufficient to definitively determine the causative mechanisms of cognitive impairment in PD. Further studies with larger cohorts are needed.

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Interesting Case

An Unusual Presentation of CAPD Peritonitis: Subcutaneous Emphysema

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Abstract

We here report a case of CAPD peritonitis having a very unusual presentation, subcutaneous emphysema. Peritoneal effluent cultures yielded *Pseudomonas auregenosa*. She was treated with intraperitoneal amikacin, ceftazidim, vancomycin and intravenous meropenem but the infection persisted. She eventually required removal of catheter. Jugular venous catheter was inserted and haemodialysis started.

Since 2011, a total number of 478 patients received CAPD for ESRD at Kidney Foundation Hospital and Research institute. Among these patients the rate of

peritonitis for the year of 2017, 2018, 2019 was 1 episode per 32, 28 and 22 patient months respectively. However, this is the first case of subcutaneous emphysema presenting as a complication of CAPD. While free intra-peritoneal air is known to occur in peritoneal dialysis patient, dissection of this air into the abdominal wall mimicking the subcutaneous emphysema has not previously been reported in our center.

Case Summary

Mrs. X, 66 years old diagnosed case of ESRD due to CGN with HTN was on continuous ambulatory peritoneal dialysis for 10 month. She was reasonably well with good exchange three times daily. Two months back she developed itching around catheter exit site for which she took azithromycin followed by flucloxacillin. But itching persisted and she also developed abdominal pain during exchange for which she got herself admitted in Kidney Foundation Hospital. On general examination patient was afebrile with normal vital signs. On local examination, catheter exit site was dry, erythematous with no discharge. On palpation subcutaneous crepitation was felt around the exit site but tunnel track was non tender.

On x-ray imaging there was gaseous shadow occupying right lumbar region. Complete blood count revealed Hb: 6.7 g/dL, WBC: 7K, Platelet: 187 x 103 per cumm, CRP:87 mg/L. Peritoneal effluent was clear with 4/cmm cells, negative for AFB, Gene X-pert and culture yielded no growth. Then she was treated with intraperitoneal, topical antibiotic and oral antifungal. Inflammation subsided and crepitation resolved.

She was doing well for one month then she again developed pain during exchange. At his time it was associated with discharge from the exit site.

Figure 1. X-ray abdomen erect posture showing gaseous shadow at rightt lumbar region.



Peritoneal effluent was clear with 1400 cells/cmm with growth of *Pseudomonas species* and *Staphylococcus haemolyticus*. She was treated with injectable antibiotic for 14 days after consulting local doctor but didn't improve hence again admitted herself in our hospital. On examination patient was afebrile but erythematous lesion extended with no discharge or tunnel tract tenderness. Peritoneal effluent was still clear with no growth. She was also negative for Quantiferon TB Gold. CAPD exchange was good but CRP was elevated persistently and repeat X-ray imaging revealed persistent gaseous shadow in right lumbar region.

Skin and abdominal wall ultrasonogram was done which showed air fluid collection around the tunnel suggestive of tunnel infection. Intraperitoneal and topical antibiotic was instituted but condition didn't improved.

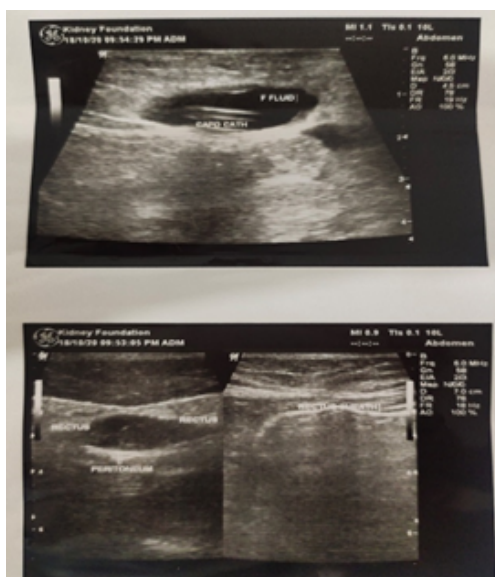


Figure 2. Ultrasound scanning of abdominal wall and skin showing mild fluid collection appearing as branching, anechoic striations suggestive of CAPD exit site cellulitis with tunnel infection.

Eventually CAPD catheter was removed. Followed up imaging showed resolved fluid gaseous shadows. Patient started taking haemodialysis through JVC and later on AVF was constructed. Her general condition improved.

Discussion

Peritonitis continues to be a leading complication of PD which accounts for 18% of the infection-related mortality in PD patients. The incidence of Exit site infection in PD patients ranges from 0.05 to 1.02 episodes per patient-year. The incidence of Exit site infections is seen anywhere between one episode in 27.3 patients' months to one episode in 41.9 patients' months [1]. The diagnosis of Tunnel Infection is mainly based on clinical suspicion and ultrasound examination. The extent of involvement of the subcutaneous PD catheter tract is a critical factor in the development of peritonitis [2]. Presentation of CAPD catheter related infection can be variable from erythema to purulent discharge or abdominal pain during exchange. Here we report a first case of CAPD peritonitis presenting with subcutaneous emphysema around the exit site.

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ISPD ASIA-PACIFIC CHAPTER SCHOLARSHIPS: AN UPDATE

Aims

The purpose of these awards is to promote PD awareness, knowledge and expertise by visiting a centre of excellence for 2-3 months. It is intended primarily for nephrologists and renal nurses in the Asia-Pacific region, especially in the developing countries.

NB. Developing countries refer to those countries eligible for ISPD institutional membership.

Application Process

The ISPD APC aims to offer up to two fellowship grants per semester. The deadlines for applications are 30th June and 31st December respectively.

Each application must include the following documents: (1) A completed application form along with (2) a curriculum vitae, (3) a recommendation letter from the director of the nephrology unit or department, (4) a letter of acceptance from the institution to be visited; and (5) a motivation letter, . A letter of support from the administrator of the applicant's institution is advisable.

The application should be submitted to the ISPD Asia Pacific Chapter Core Group coordinator. The Core Group reviews the applications with respect to merit, appropriateness, facility to be visited, the supervising physician/trainer at the facility, and geographic distribution of applicants. Preference is given to promotion of peritoneal dialysis in developing countries.

Notification of the Committee's decision will be made by ISPD Asia Pacific Chapter Core Group within three months of close application.

Amount for the Award

The award funds are to be used to support travel and living expenses during the visit and/or to support the learning process during the visit, covering an economic round-trip airfare and living allowance to a maximum US\$1,500 per month depending on the living standard of the training center city. The total maximum per individual cannot exceed US\$3,000. Financial breakdowns with supportive evidence are required for award amount approval.

Payment method

ISPD APC Fellowships will be normally transferred at the end of the stay, after reception and approval of the final report.

Funds can be transferred by wire transfer, or by check. An advance up to 50% can be requested to face the costs of travel and accommodation. Bigger advances are possible, but their approval will be decided case per case.

Duration of Visit

The applicant shall spend at least 6 weeks at the training site. There is no partial award to support visits of less than 6 weeks. The applicant should commence the visit within 6 months after notification of the award. Candidates may extend the training period beyond 3 months at their own cost. Postponement of

commencement date should get prior approval, or it would lead to loss of the scholarship.

Eligibility

Applicants must be an ISPD members.

- For medical applicants, candidates who have completed their nephrology training and with some working experience as a junior consultant would be preferred.
- For applicants of other healthcare professionals, candidates who have a working experience of at least 5 years would be preferred.

There is no age restriction. Excluded from eligibility are employees of industry. The training center must be a center in Asia or Australia /Oceania with more than 75 home PD patients and has been established for not less than 5 years. Priority will be given to clinical training. A list of available, but not exclusive, training centers is available for contact [\[LINK TO WEBPAGE\]](#).

Deadline for Application: 30 June or 31 December each year

[Click here to download the application form.](#)

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