



ISPD Asia-Pacific Chapter Newsletter, August 2023

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Prepared by Chia-Te LIAO and Cheuk-Chun SZETO

News from the ISPD

International Society for Peritoneal Dialysis and Korean Society of Nephrology signed the Memorandum of Understanding on 28 April 2023 at Seoul, Korea, during the KSN Annual Scientific Meeting



Pictures: (Left and middle) **Prof. Edwina Brown**, President of ISPD and **Prof. Chun Soo Lim**, President of KSN. (Right) Group photo in the ISPD - KSN MOU Ceremony.

ISPD Asia Pacific Chapter: New Coordinator Announcement

Professor Talerngsak Kanjanabuch from Thailand will be the next ISPD Asia Pacific Chapter coordinator. He will officially take up this position from the coming ISPD Asia Pacific Chapter meeting in New Delhi.

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- Application for ISPD Scholarships and Grants

Membership for developing countries can be done at advantageous rates, by grouping members by institution or region geographical area. Write to admin@ispd.org for more information.

Upcoming Meetings

10th International Society for Peritoneal Dialysis Asia Pacific Chapter Meeting

22-24 September 2023

Pullman Hotel, Aerocity, New Delhi, India

Deadline for abstract submission: 31 July 2023

Website: <https://www.ispd-apcm2023delhi.com>

EuroPD 2023

27-30 November 2023

Bruges Meeting & Convention Centre (BMCC), Bruges, Belgium

Abstract Submission Deadline: 31 July 2023

Early Bird Registration Deadline: 15 September 2023

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

International Society for Peritoneal Dialysis 2024 Congress

26-29 September 2024

Dubai World Trade Center, Dubai, UAE

More information: www.ispd.org/dubai2024

International Society for Peritoneal Dialysis Meetings in 2025 and 2026

The process of selecting the host of the Asia Pacific Chapter Meeting in 2025 is ongoing. By the end of June, the bids from candidate cities have been received and are being evaluated by the Asia Pacific Chapter Core Team.

For the ISPD Congress of 2026, the deadline to submit your bids expires on September 1st, 2023. There is still a month to prepare and submit your proposal. If you and your national society would be willing to host the ISPD Congress in 2026, you can [find here the Request for Proposals \(RFP\)](#). You can [contact the ISPD Secretariat](#) if you have any questions.

Guideline Update

Summary of the KDIGO (Kidney Disease: Improving Global Outcomes) Controversies Conference on Home Dialysis



Guttiga Halue, M.D. (far left) [1], Theerachai Thammathiwat, M.D. (second left) [2], Talerngsak Kanjanabuch, M.D. (second right) [3], Jeffrey Perl, M.D. (far right) [4]

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Home dialysis refers to administering dialysis treatments in the comfort of a patient's home instead of receiving treatment at a dialysis center or hospital. It allows individuals with kidney failure to undergo regular dialysis treatments while maintaining greater flexibility and independence in their daily lives. There are two types of home dialysis, home hemodialysis (HHD) and peritoneal dialysis (PD). However, the worldwide penetration of home dialysis is still far below than in-center HD (ICHD). This narrative summarizes the Conclusion from the 2023 KDIGO Controversies Conference on Home Dialysis, recently published in the *Kidney International* journal, [1] aiming to increase uptake of the KDIGO guidance, expand the use of home dialysis, and understand the factors affecting home dialysis utilization (e.g., policy, facility, and patient factors) in the Asia-Pacific PD peers.

FACTORS AFFECTING MODALITY SELECTION

Three main factors affecting home dialysis utilization are summarized in Table 1. Actions by the payer and provider are likely to have the greatest impact. Payer interventions can take several forms, such as direct fiscal incentives or penalties, coverage for a particular modality type(s), capacity limits, or a combination. Incentives to providers should reach the healthcare team supporting home dialysis (Figure 1). However, financial incentives alone are only one piece in a complex system; other components are needed to consider when expanding the use of home dialysis.

Table 1. Factors affecting home dialysis utilization.[1]

Healthcare system factors • Overall availability, access to, and willingness to pay for dialysis • Relative delivery costs of center vs. home dialysis • Relative reimbursement for center vs. home dialysis • Regional cultural factors • Home dialysis (i.e., PD) first or home dialysis preferred policies • Provider financial incentives and/or penalties
Clinic/facility factors • Clinician and treatment team bias and prejudices about home dialysis candidacy/contraindications for home dialysis • Education and expertise of healthcare professionals • Reimbursement to patients for dialysis-related costs (electricity, waste disposal, etc.) • Timely, functional, complication-free dialysis access • CKD and modality education programs • Inpatient and acute care CKD and modality education • Pathways for urgent dialysis start • Modality decision support • Assisted home dialysis • Peer-to-peer support
Individual factors • Suitable home environment • Presence of perceived/relative medical contraindications (e.g., obesity, abdominal scarring) • Socioeconomic factors • Receipt of education and decision support • Available social support (family, other) • Physical and cognitive limitations • Health literacy • Personal beliefs (cultural, prior experiences) • Personal and care partner preferences: perceived disincentives (fear of self-cannulation, medicalization of home) • Personal and care partner preferences: perceived incentives (i.e., travel, treatment autonomy, distance to in-center clinic) • Ability to maintain employment

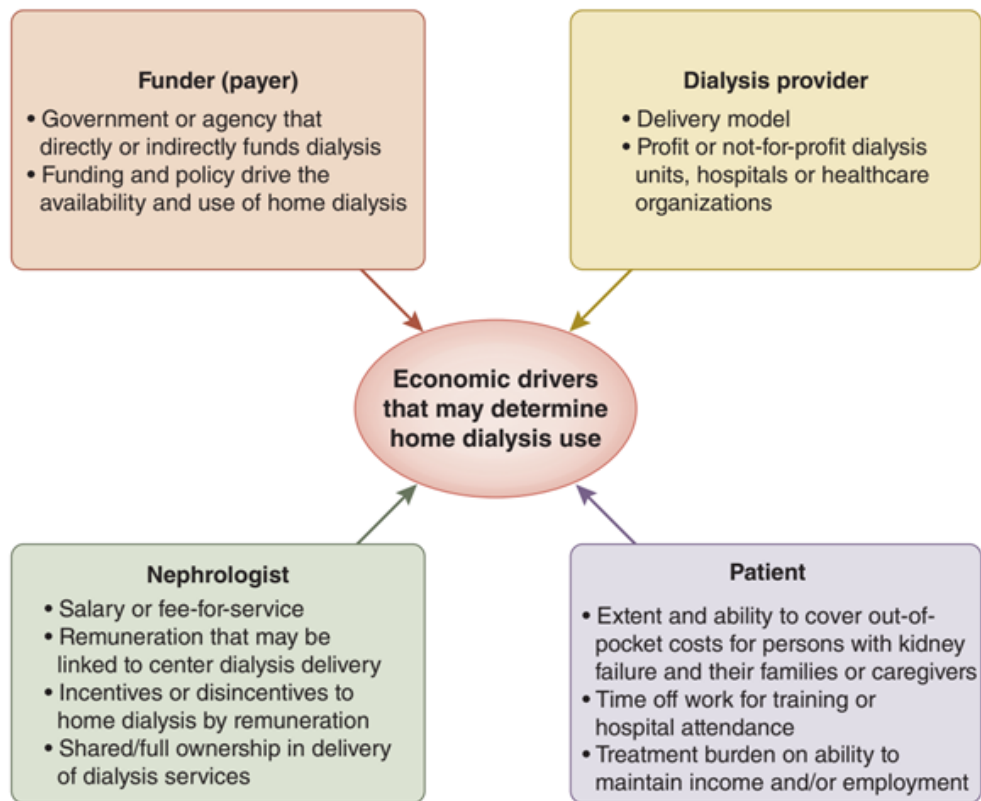


Figure 1. Economic drivers affecting the use of home dialysis.[1]

The benefit of home dialysis over in-center dialysis

Although there is a lack of studies that provide irrefutable proof in improved hard outcomes for home dialysis vs. in-center dialysis, home dialysis offers several benefits compared to center-based dialysis, including: **(1) Better health outcomes:** Home dialysis provides better blood pressure control and more flexibility in managing fluid and diet restrictions. **(2) Improved quality of life:** By receiving dialysis at home, patients have more control over their treatment and experience a greater sense of independence. They can maintain their daily routines, spend more time with family and friends, and engage in activities they enjoy. Home dialysis eliminates the need for frequent trips to a dialysis center, providing greater convenience and flexibility in scheduling treatments. Moreover, home dialysis often leads to an improved quality of life and a sense of patient empowerment. **(3) Cost-effectiveness:** Home dialysis can be cost-effective compared to in-center dialysis. While upfront costs may be involved in setting up a home dialysis program, long-term savings can be achieved due to reduced clinic visits, transportation expenses, and potential hospitalizations. Additionally, home dialysis may provide financial benefits for healthcare systems and payers due to lower overall healthcare utilization.

EXPANDING HOME DIALYSIS PROGRAM

Expanding a home dialysis program can be complex, but it is achievable with careful planning and execution. The global perspective on access to home dialysis and the six steps to consider when expanding a home dialysis program is demonstrated in Figure 2 and Diagram 1. Since the benefits of home over in-center dialysis on hard outcomes are limited, modality choice should rely on individual patient characteristics, patient preferences, lifestyle considerations, and medical suitability. The critical role of environment, technology, and support in enabling dialysis at home is highlighted in Figure 2. It is crucial to have open and transparent communication throughout the decision-making process, ensuring that patients and their family are well-informed and actively involved in selecting the home dialysis modality that best suits their individual needs and circumstances. This collaborative approach ensures that the patient's values, preferences, and clinical considerations are taken into account when selecting a home dialysis modality.

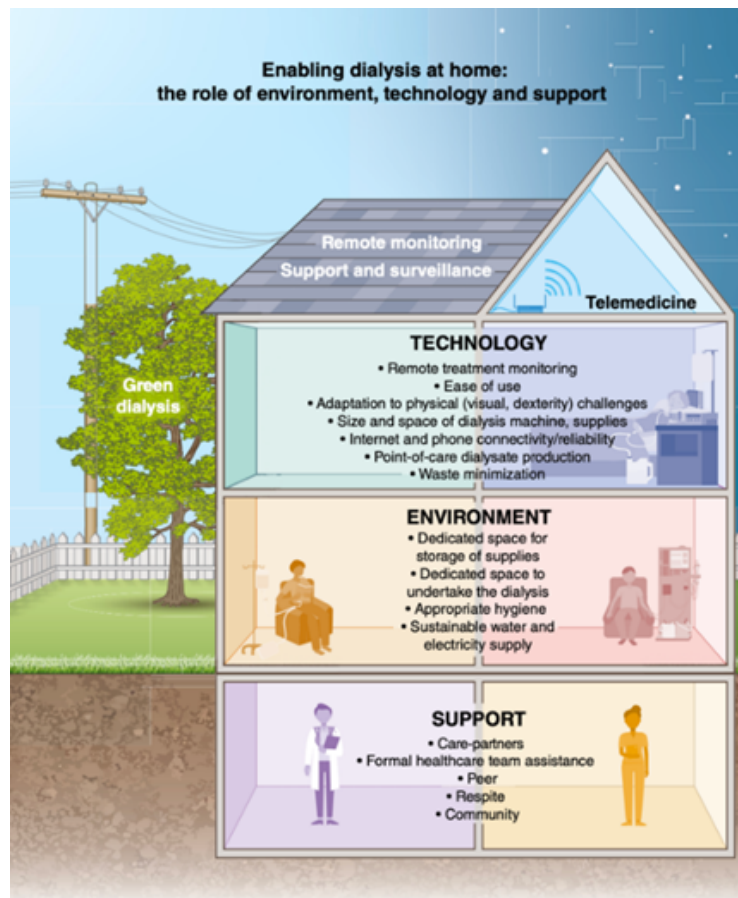
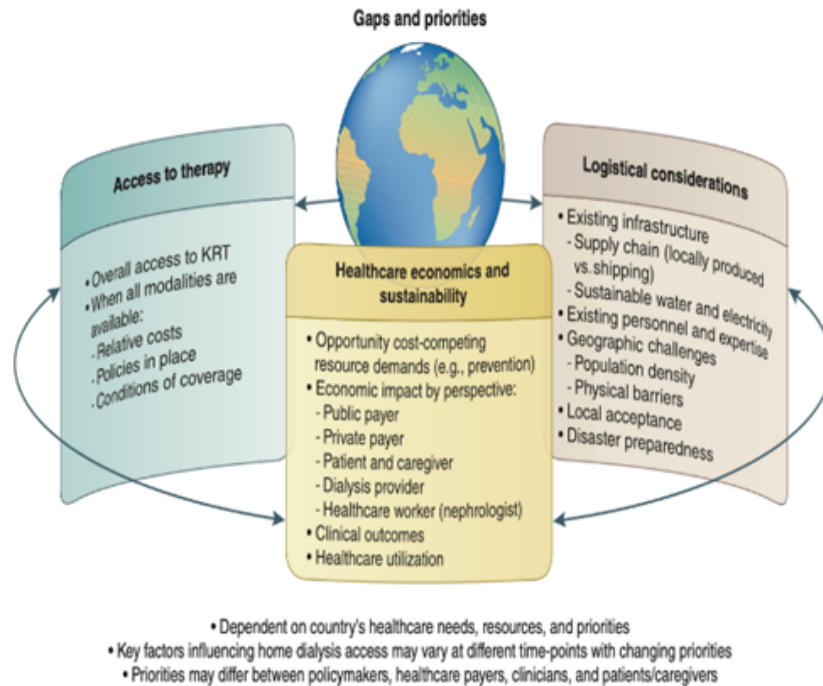


Figure 2. (Upper) global perspective on access to home dialysis. (Lower) role of environment, technology, and support in enabling dialysis at home.[1]

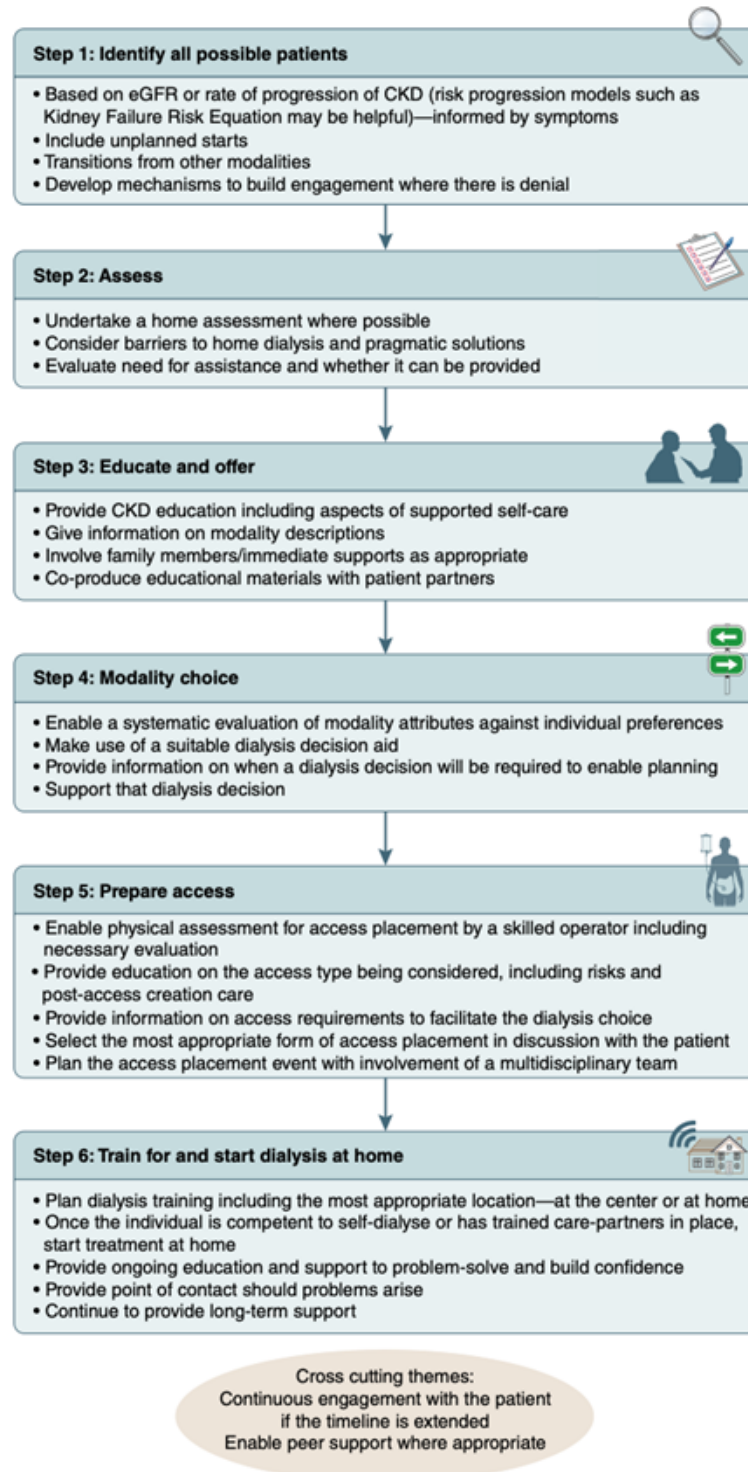


Diagram 1. The 6 steps to consider when expanding a home dialysis program.[1]

1. Patient training and education

Providing comprehensive education and ensuring the patients understand the benefits, risks, and requirements associated with each home modality can increase home dialysis uptake.

- Education should be iterative, culturally sensitive, and consistent when provided by different team members. It can be provided in groups or one-to-one with healthcare teams, videos, written materials, and peer support. Using a variety of education methods is essential to accommodate learning styles.
- Establishing early education that includes home dialysis opportunities in each program for kidney failure patients who have unplanned dialysis starts.
- Establishing a dedicated team for new-start patients after discharge from the hospital to facilitate education for patients who may have yet to receive predialysis education or make their modality decision.
- Incorporating peer support into dialysis programs since it provides vital and unique insights for new patients who are considering home treatment. Dialysis programs can work with local patient kidney organizations.
- Myths relating to home dialysis should be addressed and dispelled. Addressing unique patient barriers to home therapy is also essential.
- Providing home visits to ensure patient and family confidence in the home. Integrating remote consultation and monitoring may be optional.
- Managing patient expectations and specifying that a change of modalities may be necessary in the future.
- Providing support contacts for reassurance and enabling problem-solving. Reassurance should be provided that nursing or medical and technical support will continue when patients are at home.
- Improving clinician education and providing support to small centers are critical for increasing home dialysis utilization.

2. Assisted home dialysis [1,2]

Assisted home dialysis allows a totally dependent patient to access home dialysis treatment. Assisted home dialysis refers to the provision of assistance to individuals receiving home dialysis by caregivers (i.e., family or friend) or paid staff (i.e., professionally trained dialysis nurses, personal support workers, community health workers, or other skilled aides). Assistance can be nontechnical (e.g., carrying dialysate bags into patient rooms), or technical (e.g., machine setup, dialysis-related operations), paid or unpaid, and non-PD or PD related. Unfortunately, the optimal methods for educating and supporting caregivers of dialysis patients are unclear. Evaluation of the caregiver for burnout and stress should be proactively scheduled.

3. Home dialysis program development and provider education

For many instances, developing and implementing local quality-improvement initiatives may be more successful for increasing home dialysis utilization than top-down approaches. A roadmap for developing home dialysis programs includes local assessment of needs, mentorship/support by local/regional expertise, and standardization of processes and procedures (e.g., patient education, access creation, and treatment of common complications). Facility culture is critical for maintaining a successful program and increasing patients' uptake of home therapies.

- (a) Establish standard protocol with comprehensive patient-centered education, well-defined care models delivered by dedicated multidisciplinary healthcare staff skilled in patient training and monitoring, and adequate infrastructure and organization.
- (b) Establish early and comprehensive core training in all KRT options, including home dialysis, to all healthcare professionals, including fellowship trainees involved in caring for CKD patients. Training should be supported by a system of competencies and responsibilities.
- (c) Establish specific home-dialysis educators and navigation specialists with skill sets on modality expertise and complex case management in the home setting.
- (d) Anticipating and planning for modality transitions focusing on home dialysis since the modality transitions are often complex for centers to manage and can be distressing and frightening for patients.
- (e) Build system resilience for all possible disaster types, including the COVID-19 pandemic. Home dialysis can be advantageous in terms of flexibility and safety, but it relies on the availability of supplies and consistent access to electricity and clean water. The facility should explore the role of improving access to telemedicine, build redundancies in facility staffing and home dialysis training resources, and enhance support so that patients can continue to receive treatment at home during the disaster.

Summary

Despite several benefits of home over in-center dialysis have been emphasized in this narrative, expanding a home dialysis program can be a complex task. However, it is certainly achievable with careful assessment, planning, and execution. This narrative reaffirms the need for advocacy and efforts to ensure equitable access to home dialysis for all individuals needing KRT globally. There is no one-size-fits-all model for promoting and delivering home dialysis at any level, from patient to facility to healthcare system. Therefore, practical approaches should be multipronged, engage multiple stakeholders, and take into account of local circumstances.

Acknowledgement

We express our sincere gratitude to Mr. Michael Cheung who made significant contributions to this narrative. In particular, we would like to extend a special thanks to the Kidney Disease: Improving Global Outcomes (KDIGO) for its generous support for this work.

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Summary of The World Congress of Nephrology 2023 (WCN'23), Thailand: March 30 – April 2, 2023



Michael Podt, ISN Event Director (Far left)

Professor Talerngsak Kanjanabuch, M.D., Secretary General of the Nephrology Society of Thailand (Second left)

Associate Professor Surasak Kantachuvesiri, M.D., Chair of the Local Organizing Working Group (Middle)

Professor Sydney C.W. Tang, M.D., President of the Asian Pacific Society Nephrology (Second right)

Professor Agnes Fogo, M.D., Immediate Past President of the International Society of Nephrology (Far right)

The World Congress of Nephrology (WCN) is the leading annual scientific and educational event in international nephrology. This year, the World Congress of Nephrology (WCN'23) took place in the Queen Sirikit National Conventional Center (QSNCC), Bangkok, Thailand, from March 30 – April 2, 2023, and cohosted with the Nephrology Society of Thailand (NST) and the Asian Pacific Society of Nephrology (APSN). The congress offered a scientific and networking program to over 3,200 delegates from over 132 countries on cross-cutting themes of prevention, clinical and laboratory research, pediatrics, allied health, policymaking, and the lived-experience perspective.

The congress started with the 2-day pre-congress satellite course themed "Kidney Diseases in the Tropics and Developing Countries" at the Dusit Thani Hotel, Pattaya, on March 27 and March 28, 2023, followed by 6 pre-congress courses at the QSNCC and one hand-on workshop (e.g., PD catheter insertion, Seldinger technique) at the Medpark Hospital on March 30, 2023. A Global Kidney Policy Forum was hosted on the same day, which was attended by Dr. Sophon Mekthong, Vice Public Health Minister of the Thai Royal Government, Dr. Opas Karnkawanpong, General Secretary, Thai Ministry of Public Health and Dr. Jadet Thammaaree, Secretary General of the National Health Security Office.



Research News from Asia-Pacific Region

Comparable outcomes between a combination of peritoneal dialysis with once-weekly hemodialysis and thrice-weekly hemodialysis: A prospective cohort study



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A combination of peritoneal dialysis (PD) with once-weekly hemodialysis (HD) (PD+HD therapy) has been almost exclusively performed in Japan [1, 2]. In PD+HD therapy, patients usually undergo PD 5 days a week, HD once a week, and no dialysis once a week. PD+HD therapy intends to provide clearance and ultrafiltration which are insufficient with PD alone while maintaining a flexible lifestyle and better quality of life with PD.

Previous studies reported favorable changes after the transition from PD alone to PD+HD therapy. These include better blood pressure control [2-7], a decrease in serum creatinine and β 2-microglobulin levels [2-6], and a decline in dialysate-to-plasma creatinine ratio (D/P Cr) [2, 5, 7]. However, these studies are limited by small sample sizes and the lack of control groups. Recently, we reported that all-cause, cardiovascular, and infection-related mortality was significantly lower among those on PD+HD therapy compared with those on PD alone based on the Japanese Society for Dialysis Therapy Renal Registry (JRDR) [8, 9].

However, previous studies compared PD alone and PD+HD therapy. Another clinical question is which would be better to change modality from PD to PD+HD therapy or thrice-weekly HD when it becomes difficult to sustain sufficient ultrafiltration and solute clearance by PD alone. In a recent study, we compared mortality between those who transited from PD to PD+HD therapy and those who transited to thrice-weekly HD using data from JRDR.

Study design: A prospective cohort study on JRDR, which is a nationwide cohort of dialysis patients in Japan.

Setting and participants: Subjects undergoing PD at some point from 2010 to 2018 who changed their modality from PD to PD+HD therapy or thrice weekly HD from 2011 to 2018.

Exposure of interest: PD+HD therapy, defined as a combination of PD and once-weekly HD, compared with thrice-weekly HD.

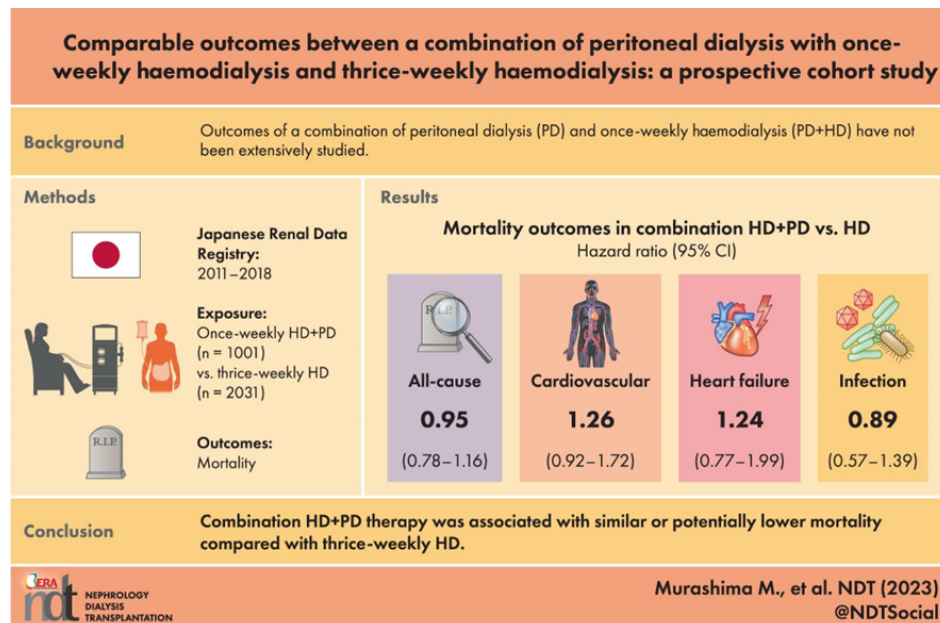
Outcomes: All-cause, cardiovascular, congestive heart failure-related, and infection-related mortality.

Statistical analyses: Cox proportional hazard models.

The main analysis was performed by an intention-to-treat-based approach, in which the observation period was until death or the end of 2019. The data were adjusted for age, sex, causes of end-stage kidney disease, blood urea nitrogen, creatinine, albumin, albumin-corrected calcium, phosphate, and intact parathyroid hormone levels, history of myocardial infarction or coronary artery disease (history of myocardial infarction were collected from 2010-2016 and history of coronary artery disease were collected in 2017 database), hemorrhagic stroke, ischemic stroke, limb amputation, urine output at the end of the preceding year, and the number of events for peritonitis during the preceding year.

Main results

During a study period, 1001 subjects transitioned to PD+HD therapy and 2031 to thrice-weekly HD, respectively. Those on PD+HD therapy were significantly younger, had higher serum blood urea nitrogen, and creatinine, and were less likely to experience peritonitis during the preceding year. The median (interquartile range) time on PD+HD therapy was 2 (1-5) years. During a median follow-up of 3.5 years, 575 subjects died. All-cause, cardiovascular, congestive heart failure-related, or infection-related mortality were not significantly different between those on PD+HD and those on thrice-weekly HD.



Sensitivity analyses by propensity score (PS) matching, PS matching with shared frailty model in which dialysis facilities were treated as a random effect, inverse probability weighting (IPW), PS adjustment, PS stratification, competing risk regression, and on-treatment analyses in which data were censored at the transition to thrice-weekly HD for those on PD+HD therapy showed similar results except that infection-related mortality was significantly lower among those on PD+HD in some of the analyses.

Discussion

Mortality was comparable between PD+HD therapy and thrice-weekly HD in the short term. PD+HD therapy was associated with better quality of life [10]. Those on PD+HD therapy had higher albumin and creatinine levels and had experienced peritonitis less frequently in the past. These findings might represent better nutritional status, immune function, and personal hygiene, which might not be completely accounted for by covariates adjustment. Alternatively, those on PD+HD therapy attended fewer HD sessions and had a lower chance of infection during a pandemic of contagious diseases. The strength of the study is that this is by far the largest cohort of PD+HD therapy to our knowledge. We made efforts to eliminate selection biases. We adjusted for the number of peritonitis or daily urine output and incorporated these variables in the PS calculation. The study has several limitations. No data is available in the JRDR database on the reasons to change from PD to PD+HD therapy and change from PD to thrice-weekly HD. Also, JRDR collects data at the end of each year. As a result, the exact dates for the modality change or the data just before the modality change were not available. There could have been a change in patient condition between the end of the preceding year and the time of the modality change.

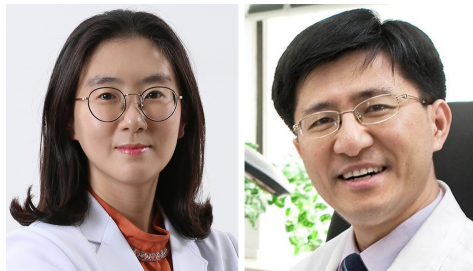
Conclusion

In conclusion, all-cause and cause-specific mortality were not significantly different between PD+HD therapy and thrice-weekly HD. Considering a flexible lifestyle and health-related quality of life, PD+HD therapy could be a great option for patients with end-stage kidney diseases.

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Metabolomic profiling of overnight peritoneal dialysis effluents predicts the peritoneal equilibration test type



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The peritoneal equilibration test (PET) is a common method of examining peritoneal transport characteristics that measure the rate of solute transfer and water removal across the peritoneal membrane in patients with PD. The PET result is used to individualize the PD prescription by optimizing solute clearance and maximizing daily peritoneal ultrafiltration [1], which is associated with the PD outcome [2, 3].

Metabolomics is a field of “omics,” and is an important research field along with genomics, transcriptomics, and proteomics that reveal the function of genes or proteins. It studies metabolic processes, identifies important biomarkers related to metabolic features, and uncovers metabolic mechanisms [4, 5]. Since human diseases or pathologic conditions are related to changes in metabolisms in the body, attempts to apply metabolomics to the discovery or identification of diagnostic biomarkers or therapeutic targets are increasing [6]. In particular, metabolomics has been widely applied to kidney-related diseases, since kidney-derived urine is easy to collect and reflects the status of the kidney [7, 8]. The PD effluent might be appropriate for metabolomic analysis because it is in direct contact with the site of action (peritoneal membrane) and reflects cell and tissue changes, possibly enabling the assessment of peritoneal transport characteristics in patients with PD. We recently reported that metabolomic profiling of overnight peritoneal dialysis effluents could predict PET type [9].

Of the 225 patients who started PD at Seoul National University Hospital from January 2012 to February 2016, 125 patients, who were available overnight PD effluents and modified 4.25% PET was performed, were finally analyzed. The peritoneal transporter type was categorized according to the 4hr-D/P creatinine during the PET as follows: high (>0.82), high average ($0.72\text{--}0.82$), low average ($0.62\text{--}0.72$), or low transporter (<0.62) [10]. Nuclear magnetic resonance (NMR)-based metabolomics was used to analyze the effluents and identify the metabolites. The predictive performances derived from the orthogonal projection to latent structure discriminant analysis (OPLS-DA) modeling of the NMR spectrum were estimated by calculating the area under the curve (AUC) using receiver operating characteristic curve analysis.

The number according to PET type in 125 patients is as follows: low ($n = 29$), low average ($n = 40$), high average ($n = 34$), and high ($n = 22$) PET type. Patients' mean age was 44.2 ± 13.6 years, and 65 (52%) were men. The high PET type was more common in patients with DM ($P = 0.027$). The serum albumin level was lower in the high PET type than in the other PET types ($P = 0.044$). Representative 1D proton NMR spectra are shown in Figure 1A. Supervised OPLS-DA approach was performed to establish the difference between the groups and to find biomarkers in the presence of potentially confounding variables. As a result, only high and low PET types demonstrated meaningful differences, and there was no distinction in the other groups. The OPLS-DA model score plot indicated significant differences between the high and low PET types ($R^2 = 0.737$, $Q^2 = 0.666$; Figure 1B).

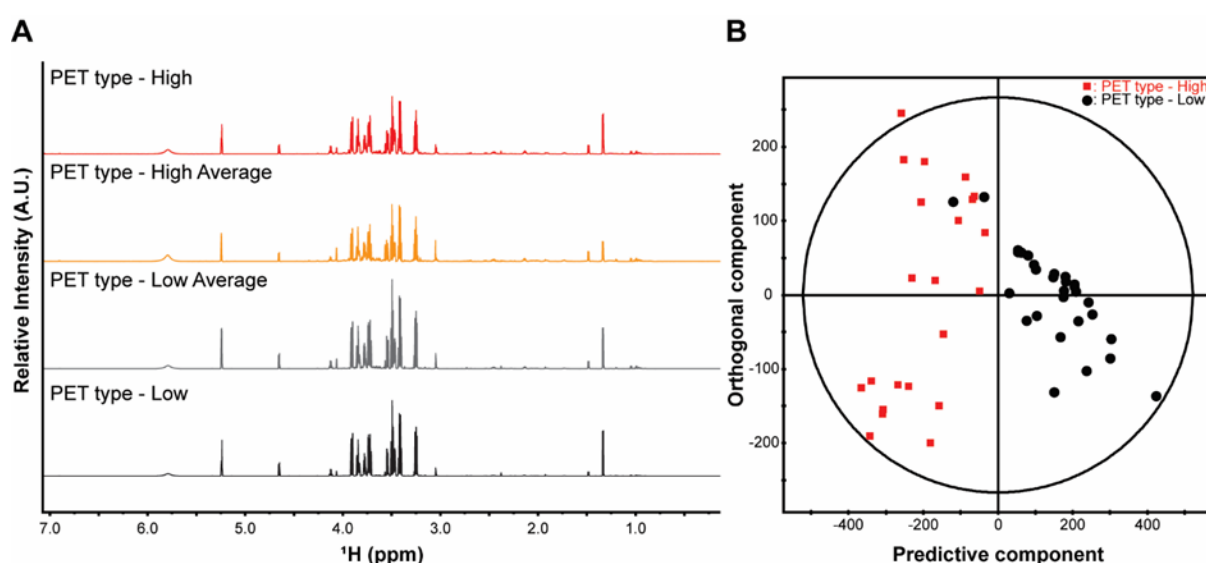


Figure 1. Representative NMR spectra obtained from overnight PD effluents and multivariate analysis between the PET types. (A) In total of 125 PD effluent samples were analyzed using 1D proton NMR spectra and representative samples from each group. (B) OPLS-DA score plot derived from NMR spectra of overnight PD effluents between high and low PET types.

Major contributing metabolites for the separation of PET types were identified by statistical total correlation spectroscopy (S-TOCSY; Figure 2). The relative concentrations of alanine (1.48 [doublet] ppm) and creatinine (4.07 [singlet] ppm) were greater in the high PET type than in the low PET type. The relative concentrations of glucose (3.22 [multiplet], 3.38–3.91 [multiplet], 5.23 [doublet] ppm) and lactate (1.33 [doublet] ppm) were greater in the low PET type than in the high PET type. To confirm the validity of the markers found in this multivariate analysis, we also used the Benjamini–Hochberg

correction. Alanine (1.48 ppm) and creatinine (4.07 ppm) levels were statistically higher in the high PET type, whereas glucose (3.48 ppm) and lactate (1.33 ppm) levels were higher in the low PET type. We performed receiver operating characteristic (ROC) analysis to determine how well these 4 metabolites predict the performance of PET criteria diagnosis. The AUC value of the combination of the 4 markers (0.975) with multiple ROC analyses was higher than that of each of the metabolites, implying that these 4 metabolites account for most of the metabolic difference between the high and low PET types.

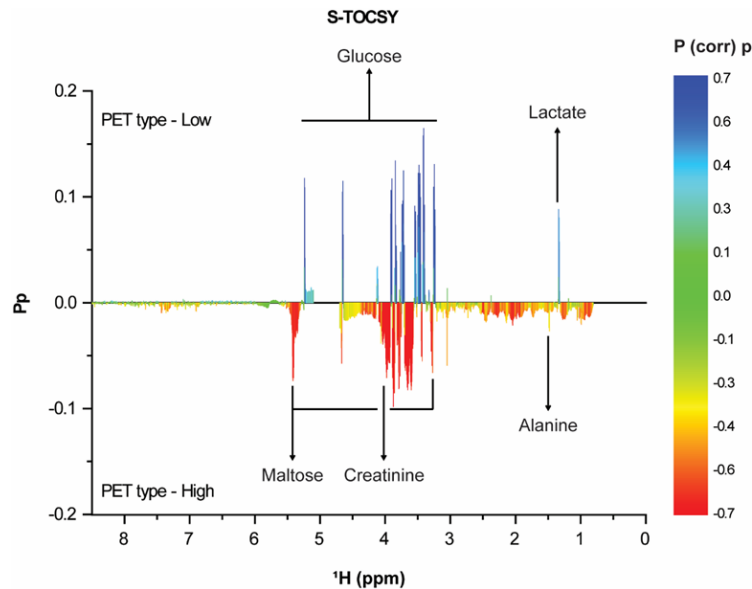


Figure 2. Identification of metabolites contributing to the discriminating model.

We tested whether the PET results, the 4 hour-D/P creatinine or 4-hour to 0-hour dialysate glucose ratio (4hr-D/D₀ glucose) measured in the hospital, is correlated with the total NMR metabolomics profile of overnight PD effluents. Partial least square regression analysis showed a significant correlation between the measured PET results (dependent variable) and total NMR metabolomics profile (independent variable) [dialysate-to-plasma creatinine ratio at the 4-hour dwell time (4hr-D/P creatinine): $R^2 = 0.652$, $Q^2 = 0.538$; 4hr-D/D₀ glucose: $R^2 = 0.447$, $Q^2 = 0.381$; Figure 3]. These data suggest that, in addition to the individual markers above, total NMR metabolomic profile might be useful in predicting the PET type of patients.

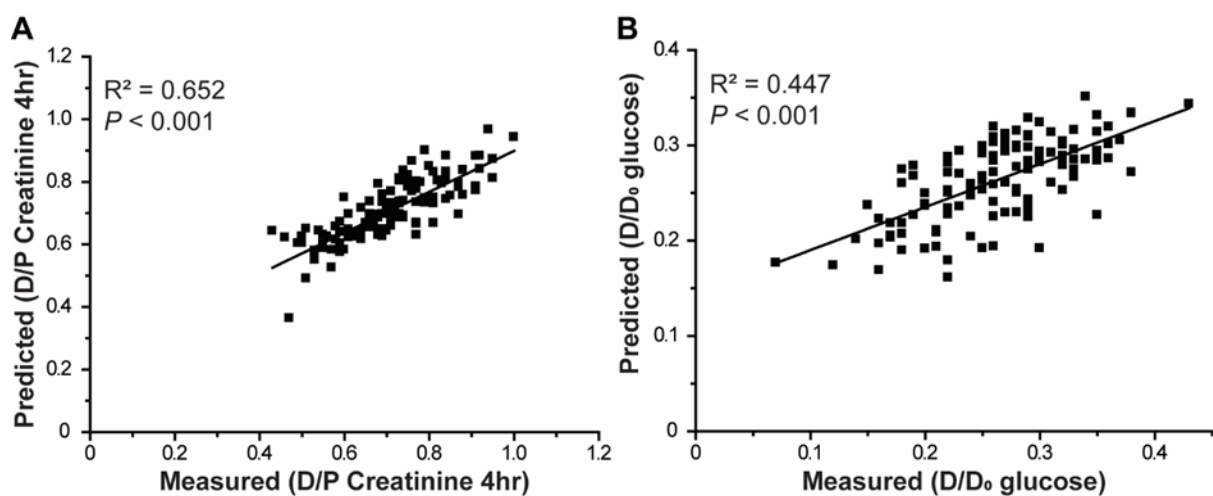


Figure 3. Prediction of measured PET results from total NMR signals. Prediction model between total NMR signals and measured PET results: A. 4hr-D/P creatinine and B. 4hr-D/D₀ glucose.

In the present study, we predicted modified PET types using overnight PD effluents in a rapid, non-invasive manner with NMR metabolomics. NMR is one of the most widely used analytical techniques in metabolomics research, with various benefits including excellent repeatability, sample recovery, and non-destructive sample handling. The overnight PD effluents are easier to obtain than samples during PET. In addition, since PD directly contacts the action site, which is a peritoneal membrane, it can reflect the peritoneal characteristics of patients with PD. If our results are validated in larger cohorts, there may be a possibility that NMR measurement of PD effluents may be a convenient option for PD patients.

Conclusion

In conclusion, creatinine and alanine were contributing metabolites in the high PET type, whereas glucose and lactate were contributing metabolites in the low PET type. Measured PET results correlated well with total NMR signals.

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A simplified and very accurate way of calculating PD-peritonitis rate



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In a recent systematic review, I documented the work of thousands of people around the world in recording annual PD-peritonitis rates in national registries [1]. This publication was one of the drivers for a new global standard of 0.4 episodes / patient-year for PD-peritonitis [2]. A less recognised implication of the study was that only a minority of countries around the world reported PD-peritonitis rates. Some of these countries clearly have other channels for reporting rates, such as the United States where the national renal data system is merely a front-end – it is regional / state or private networks that hold such data, making reports (albeit confidentially) to their own stakeholders rather than nationally. Other countries in this category include Germany and Canada. For most countries, however, the issue is as plain as it sounds – PD-peritonitis rates are not reported because they are not collected.

In speaking with various subject-matter experts around the world, there are several reasons why rates are not collected. In some countries, there is a lack of knowledge on how to measure it. In Saudi Arabia in 2021, for instance, 10-20% of the 36 PD centres measured PD-peritonitis rate as a % of prevalent patients having peritonitis, or ratio of number of patients having had peritonitis versus those who had not, or simply as a standalone count. In other countries, such as Vietnam in 2021, almost all units were aware of how to measure and report PD-peritonitis rate. However, they lacked IT infrastructure to automatically collect the data to make the calculation, and/or lacked the person-power to collect it manually.

So, what is it about the calculation of PD-peritonitis rate that is so hard? Consider the standard formula below for annual PD-peritonitis rate:

$$\frac{\text{Number of PD peritonitis episodes during Year for } N \text{ patients}}{\sum_{\text{Patient } 1}^{\text{Patient } N} \left(\frac{\text{Days on PD during Year}}{365.25} \right)} \quad \text{Eq 1}$$

Or in plain English:

$$\frac{\text{Number of PD peritonitis episodes during Year for } N \text{ patients}}{\frac{\text{Total time – on – PD for } N \text{ patients in the year, expressed as years}}{}} \quad \text{Eq 2}$$

It is the time-on-PD that is troublesome to measure and requires knowledge of patient PD start- and end- dates. The total number of PD-peritonitis episodes is easier to find – such information is “sticky” in institutional memory, and often recorded in laboratory, pharmacy, and/or clinical information systems. It is the denominator, time-on-PD, that is the problem.

To make PD-peritonitis rate easier to calculate, the leaders of the New Zealand PD registry (NZPDR), Le Registre de Dialyse Péritonéale de Langue Française et hémodialyse à domicile (RDPLF, the PD and home HD registry of French Speaking countries), collaborated with me to develop and test the simplified formula below [3]:

$$\frac{\text{Number of PD peritonitis episodes during Year for a given center}}{\left((N_{\text{Year Start}} + N_{\text{Year Finish}}) / 2 \right)} \quad \text{Eq 3}$$

Or in plain English:

$$\frac{\text{Number of PD peritonitis episodes during Year for a given center}}{\text{The average number of patients on PD at the centre during the year}} \quad \text{Eq 4}$$

The simplified formula uses the average headcount of people on PD, rather than total time -on-PD. Every centre I have ever been to has very clear knowledge of how many patients are on PD at the beginning and end of each year, and for that matter the beginning and end of each month. Like the number of PD-peritonitis episodes, this information is also “sticky” in institutional memory, and often recorded in managerial, clinical, and even vendor (PD consumable manufacturer) databases.

To test our simplified formula, we looked at every PD centre in Australia, New Zealand, and French language-speaking countries in the RDPLF. We were able to show 99% agreement between the simplified and standard formula, which was consistent over the decades and 100,000s of PD patient-years in the registries. Very few situations arose where the simplified formula was not exactly (or nearly exactly) the same as the standard formula. We found that the simplified formula was slightly less accurate (97-98%) in smaller centres, in centres that did less automated PD than average, and perhaps in centres with somewhat older and sicker patients. The simplified formula even withstands scrutiny using the ISO (International Organization for Standardization) requirements for one measurement method being a surrogate for another [4].

Obviously, no system is perfect and there are some situations where the simplified formula should not be used. Firstly, it should not be used if one needs a precise measure of PD-peritonitis rate (e.g. in research, or where a centre is running close to 0.4 episodes / patient-year: in these situations, the calculation needs to be exact). Secondly, it should not be used where there is a strong and unbalanced pattern to starting and discontinuation of PD at a centre (e.g. when a centre is rapidly losing patients or gaining them over the year in a non-linear manner). It is fine to use if centres are gaining or losing patients at a relatively consistent rate, but not if they are losing or gaining everyone at one end of the year or the other. Finally, the simplified formula should not be used by centres with less than 5 patients on PD at any one point in time - the standard one should be used.

As a final aside, the simplified formula can also be applied to monthly PD-peritonitis rates [5]:

$$\left[\frac{\text{Number of PD peritonitis during Month for a given center}}{\left((N_{\text{Month Start}} + N_{\text{Month Finish}}) / 2 \right)} \right] \times 12 \quad \text{Eq 5}$$

Or in plain English:

$$\left[\frac{\text{Number of PD peritonitis episodes during Month for a given center}}{\text{The average number of patients on PD at the centre during the month}} \right] \times 12 \quad \text{Eq 6}$$

The same caveats on use apply to the monthly formula as they do to the annual one.

As a final note, these simplified formulae are not recommended by the ISPD as a replacement for the standard one – centres should use the standard one **if they can**. However, they are “approved” for use by units if time-on-PD is not known or PD-peritonitis rate is not calculable.

We hope that all centres doing PD will be able to calculate PD-peritonitis rate in the future to measure quality of the care that they are providing.

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Medical versus Surgery Therapy for Dialysis patients with Advanced Secondary Hyperparathyroidism – Which is Better? Important Insights from the randomized (PROCEED) Trial (PaRathyroidectomy versus Oral CinacalcEt on Cardiovascular Parameters in PEritoneal Dialysis Patients with Advanced Secondary Hyperparathyroidism)



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Secondary hyperparathyroidism (SHPT) is highly prevalent in peritoneal dialysis (PD) patients. Severe SHPT contributed to a heightened risk of cardiovascular morbidity and mortality, hospitalizations, fractures and extra-skeletal calcifications in dialysis patients [1]. Both the Kidney Disease Improving Global Outcomes (KDIGO) Clinical Practice Guidelines (CPGs) on CKD-mineral bone disease (MBD) 2009 [2] and 2017 CPGs update [3] recommended parathyroidectomy for dialysis patients with advanced SHPT that fails to respond to medical therapy. However, there are so far no randomized comparisons of parathyroidectomy versus oral cinacalcet treatment for SHPT in dialysis patients.

Wang Angela Yee-Moon et al performed a prospective randomized trial comparing medical (oral cinacalcet) versus surgical therapy (total parathyroidectomy [PTx] with forearm autografting) on various cardiovascular surrogate outcomes and health-related quality of life (HRQOL) measures in PD patients with advanced SHPT (PROCEED Trial) [4]. The randomized trial was conducted in 65 adult PD patients with advanced SHPT recruited from two university-affiliated hospitals in Hong Kong. Kidney failure patients receiving maintenance PD, age between 18 and 75 years and having advanced SHPT with imaging showing nodular or diffuse parathyroid hyperplasia were eligible for study inclusion. Advanced SHPT was defined as having elevated intact parathyroid hormone (iPTH) $\geq 84\text{pmol/L}$ [equivalent to 800pg/mL] refractory to vitamin D analog or baseline serum calcium $\geq 2.5\text{mmol/L}$ precluding use of vitamin D analog. Patients with previous parathyroidectomy were excluded.

Subjects were randomized to receive either oral cinacalcet or total PTx with forearm autografting and observed for 12 months. Cinacalcet was initiated at 25mg per day and may be up-titrated by 25mg at a time, at interval of at least 4 weeks apart in the first 12 weeks and then at every 12week intervals from 3month onwards to a maximum tolerated daily dose of 100mg as required, with an aim to achieve and maintain iPTH within 2 to 9 times of laboratory upper reference limit as suggested by KDIGO CPG 2017 Updated on CKD-MBD. Dose titrations of cinacalcet, prescription of calcium and non-calcium-based phosphorus binders and vitamin D analog throughout study were at the discretion of the treating physicians, who were encouraged to follow the published KDIGO CPGs.

The study primary endpoints were changes in left ventricular (LV) mass index by cardiac magnetic resonance imaging and coronary artery calcium scores (CACS) over 12 months. Secondary endpoints included changes in heart valves calcium scores, aortic stiffness, biochemical parameters of chronic kidney disease-mineral bone disease (CKD-MBD) and health related quality of life (HRQOL) measures over 12 months.

The results showed that changes in LV mass index, CACS, heart valves calcium score, aortic pulse wave velocity and HRQOL did not differ between-groups or within-groups over 12 months, despite significant reductions in plasma calcium, phosphorus and intact parathyroid hormone in both groups. With the same monitoring frequency, cinacalcet-treated patients had fewer hospitalizations due to hypercalcemia (1.8%) than patients who underwent PTx (16.7%) ($P=0.005$) and may be explained by PTx patients being treated more aggressively with calcium and vitamin D analogs. No significant changes were observed in HRQOL measures in either group. However, cinacalcet-treated patients experienced more cardiovascular-related hospitalizations than those who underwent PTx ($P=0.008$) and the difference remained significant ($P=0.006$) after adjusting for age, gender, background diabetes, heart failure, atherosclerotic vascular disease, duration of dialysis, iPTH, alkaline phosphatase, systolic blood pressure, diastolic blood pressure, and use of renin-angiotensin aldosterone blockers.

These data suggested that both cinacalcet and PTx effectively improved various biochemical abnormalities of CKD-MBD and stabilized but did not reduce LV mass, coronary artery and heart valves calcification, arterial stiffness or improve patient-centered HRQOL measures in PD patients with advanced SHPT.

The trial provided important evidence that cinacalcet may be used in place of PTx for treating PD patients with advanced SHPT refractory to vitamin D analog or with high/high normal plasma calcium precluding the use of vitamin D analog. Long-term and powered studies are required to evaluate the effects of PTx and cinacalcet on hard cardiovascular outcomes in PD patients.

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Peritoneal dialysis in a patient with lupus nephritis and ascites: a case report



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Introduction

Lupus nephritis is a common manifestation of systemic lupus erythematosus (SLE) and can lead to end-stage kidney disease (ESKD). The management of lupus nephritis often involves immunosuppressive medications, but the presence of additional complications, such as ascites and portal hypertension, can complicate treatment strategies. This case report focuses on a patient with lupus nephritis and portal hypertension who experienced significant ascites and underwent PD as the initial dialysis modality.

Case presentation

A 41-year-old female with a confirmed diagnosis of SLE with kidney involvement presented with a serum creatinine of 2.6 mg/dL and serum albumin of 1.6 g/dL. Kidney biopsy revealed lupus nephritis class IV, and the patient was treated with steroids and intravenous cyclophosphamide (IVCY) according to the KDIGO 2021 Clinical Practice Guideline for the Management of Glomerular Diseases [1]. After two weeks of the first IVCY dose, the patient developed acute febrile illness with ascites. Despite receiving multiple courses of IVCY and steroids, there was the improvement in kidney function and proteinuria but worsening of ascites. Nodular regenerative hyperplasia of the liver was observed on ultrasonography, indicating portal hypertension as the cause of ascites. The patient experienced tense ascites that required frequent drainage and adversely affected her daily activities and quality of life. She could not lie down and take food due to abdominal fullness. The intraabdominal pressure was measured and its range was 40-65 cmH₂O. The number of hospitalization due to symptoms from tense ascites was 10 admissions in 9 months. The number of abdominal paracentesis was 22 times with 2-6 liters of fluid drainage each time. Figure 1 showed the tense ascites which disturbed the respiration of the patient. Considering the high risk of severe infection associated with immunosuppressive medications, the decision was made to prioritize the patient's life over preserving kidney function. A Tenckhoff (TK) catheter was inserted to facilitate ascites drainage without dialysis (Figure 2, left). Figure 2 (right) shows the improvement of symptom burden after ascites were drained via the TK catheter. She developed ESKD 10 months after TK insertion and received incremental peritoneal dialysis (PD). She was referred back to the nearby hospital as she had a financial problem with the traveling expense. We monitored her health currently by phone and found that she was fine. She performed PD 4 cycles/day with only one time of admission due to volume overload. The duration of time from the date of TK insertion to the date at present is 14 months.



Figure 1. Tense ascites at initial presentation (The consent from the patient has been received).

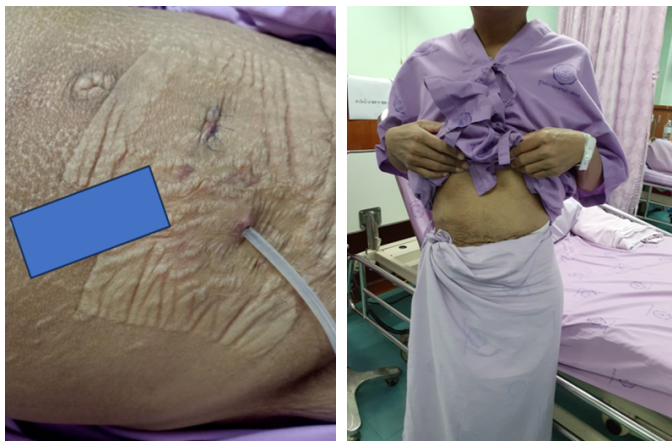


Figure 2. (Left) Tenckhoff catheter insertion and (right) symptomatic relief after ascites drainage (The consent from the patient has been received).

Discussion

Peritoneal dialysis should be informed during the process of shared decision-making regarding dialysis modalities in ESKD patients with lupus nephritis and ascites. Existing studies in meta-analysis, systematic review, or propensity score matched comparing PD and hemodialysis (HD) as initial dialysis modalities in this patient population have demonstrated similar clinical outcomes. They showed that the risk of mortality was not different in these patients who started with PD or HD [2-4]. The causes of mortality from cardiovascular and infectious complications were similar [2, 3]. The presented patient opted for PD due to the feasibility of draining ascites via the TK catheter and financial constraints that limited access to HD. She was satisfied with the outcomes because she could lie down to sleep, take food, and ambulate without support. She did not have peritonitis related to PD and only had one episode of hospitalization in 14 months since TK insertion. We suggested that PD should be encouraged for patients with ESKD and ascites from chronic liver disease (CLD). PD has benefits for patients with ESKD who have cirrhosis with tense ascites [5]. These patients may not tolerate HD because they may have unstable hemodynamics and difficulty in volume management. They have other conditions which lead complexity of HD such as coagulopathy, malnutrition, and encephalopathy. PD, in contrast to HD, may provide hemodynamic stability. Anticoagulant is not regularly used in PD therefore the risk of bleeding is less than in HD. Continuous drainage of ascites can be performed by PD to improve the symptom burden of abdominal fullness. Glucose-based PD solution can supplement calories which will be useful to patients who have malnutrition, especially from inadequate calorie intake. The disadvantages of PD in ESKD patients with ascites are the risk of peritonitis, protein loss in dialysate effluent, potential risks of mechanical complications, and the need for assistance from physical or mental capacity to perform PD [5].

Conclusion

This case report underscores the successful utilization of PD as the initial dialysis modality in a patient with ESKD from lupus nephritis and ascites. PD provided effective symptomatic relief, reduced the need for serial ascites drainage, and decreased hospitalization rates. The findings suggest that PD should be considered as a suitable option for ESKD patients with lupus nephritis and ascites, particularly those with concomitant CLD. Further research and clinical experience in this area are warranted to guide decision-making and optimize outcomes in this patient population.

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