Oral Communications 3
Hemodialysis (HD)

December 6, 2025 (Saturday) 09:30~11:00 **Venue：Room 6 (702)**

Chair(s)	Pei-Chen Wu, Chia-Lin Wu	
09:30-09:39	Gut Microbiota Dysbiosis and Metabolic Impairments Associated with Constipation in Hemodialysis Patients APCN20250132	**Hsieh Chi-Ta** Division of Renal Medicine, Department of Internal Medicine, Tungs' Taichung MetroHarbor Hospital
09:39-09:48	Visualization of Vascular Access Sounds Using a Phonocardiographic Device: A Novel Approach for Functional Assessment of Native Arteriovenous Fistulas APCN20250147	**Toko Endo** Department of Nephrology and Dialysis, H.N. Medic Medical Corporation
09:57-10:06	Trends and Practices in Early versus Late Initiation of Renal Replacement Therapy in South Korea and Taiwan APCN20250392	**Soie Kwon** Division of Nephrology, Department of Internal Medicine, Chung-Ang University Seoul Hospital
10:06-10:15	Survival Outcomes of Hemodialysis and Peritoneal Dialysis: A Nationwide Cohort Study in Taiwan APCN20250990	**Teng Jen-Hao** Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University
10:15-10:24	Analysis of the Novel LDL Apheresis Option, Rheocarna, for Chronic Limb-Threatening Ischemia in Hemodialysis Patients at Our Facility APCN20251115	**Yoshihiro Arimura** Department of Internal Medicine, Kichijoji Asahi Hospital
10:24-10:33	Optimizing Dialysis Potassium Removal: Impact of Decreasing Dialysate Potassium Profile on Hyperkalemic ESRD Patients APCN20250084	**Abhilash Chandra** Department of Nephrology, Dr RMLIMS, Lucknow

10:33-10:42	Psychometric properties of the Pittsburgh Sleep Quality Index in People Receiving Haemodialysis APCN20250737	**Ginger Chu** School of Nursing and Midwifery, University of Newcastle
10:42-10:51	Long-Term Costs and Hospitalization Rates of Planned Hemodialysis Versus Peritoneal Dialysis in Taiwan: A National Cohort Study APCN20250879	**Ho-Ting Hsuan** Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University
10:51-11:00	Effective Removal of Cytokines Using Polyacrylonitrile (AN69) Membranes Compared to Polysulfone (PS) and Polymethyl Methacrylate (PMMA) Membranes During the Initiation of Hemodialysis APCN20251011	**Koji Okamoto** Department of Nephrology, Tohoku University Graduate School of Medicine

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250132

Gut Microbiota Dysbiosis and Metabolic Impairments Associated with Constipation in Hemodialysis Patients

Hsieh Chi-Ta[1]; Paik-Seong Lim[1,2]; Ming-Yin Wu[1]

[1] Division of Renal Medicine, Department of Internal Medicine, Tungs' Taichung MetroHarbor Hospital, Taichung, Taiwan

[2] Department of Life Science, College of Life Science, National Chung Hsing University, Taichung, Taiwan

Abstract

Background:

Constipation is common in hemodialysis (HD) patients and is often linked to gut microbiota alterations. This study evaluated gut microbiota composition and function between constipated and non-constipated HD patients, and their associations with uremic toxins and systemic inflammation.

Methods:

Sixty-one HD patients were stratified by constipation status. Fecal 16S rDNA sequencing (Illumina) generated 817,970 high-quality reads. Microbial diversity, composition, and predicted functions were analyzed using USEARCH, LEfSe, PICRUSt, and STAMP. Correlations with uremic toxins (PCS, IS) and inflammatory markers (IL-6, LBP) were examined.

Results:

Constipated patients showed reduced genus-level diversity (Observed index p=0.012; InvSimpson p=0.024) and distinct microbiota profiles (PERMANOVA p=0.035), with higher Firmicutes-to-Bacteroidetes ratios and enriched Ruminococcus, Faecalibacterium, and A. muciniphila. Non-constipated patients had higher Bacteroides, Prevotella, and Parabacteroides. Functional predictions revealed significant reductions in key microbial metabolic pathways among constipated patients, including vitamin and cofactor metabolism (q=0.00678), protein maintenance pathways such as folding, sorting, and degradation (q=0.043), and energy metabolism (q=0.043). These functional impairments were also strongly correlated with elevated uremic toxins (PCS, IS) and inflammatory markers (IL-6, LBP), particularly among Firmicutes genera.

Conclusion:

Constipation in HD patients is associated with gut dysbiosis characterized by reduced microbial diversity, impaired metabolic functions, and higher systemic toxin and inflammatory burdens. Restoring microbial balance through dietary interventions or probiotics may improve gut and systemic health in this population.

Keywords：Hemodialysis, Constipation, Gut microbiota, Uremic toxins

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250147

Visualization of Vascular Access Sounds Using a Phonocardiographic Device: A Novel Approach for Functional Assessment of Native Arteriovenous Fistulas

Toko Endo[1]; Mai Obinata[2]; Kenta Kudo[2]; Shogo Kori[2]; Daisuke Tokuchi[2]; Kanae Kudo[2]; Yoshiatsu Utsumi[2]

[1] Department of Nephrology and Dialysis, H.N. Medic Medical Corporation

[2] Department of Clinical Engineering, Division of Medical Technology, H.N. Medic Medical Corporation

Abstract

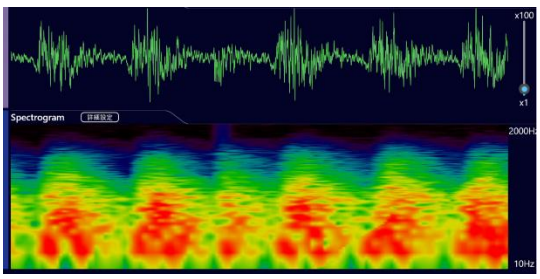
Introduction: Auscultation plays a vital role in evaluating vascular access (VA) function in hemodialysis care, serving as a frontline tool for detecting stenosis, thrombosis, and other access-related abnormalities. Despite its widespread use, conventional auscultation relies heavily on the clinician's experience and subjective interpretation, leading to significant inter-observer variability. This lack of standardization hinders consistent understanding of the clinical significance of abnormal shunt sounds. In October 2022, the AMI-SSS01, a novel phonocardiographic device, was approved in Japan. The device enables real-time visual representation of acoustic signals, initially developed for heart sound analysis. We hypothesized that it could be applied to arteriovenous fistulas (AVFs), enabling an objective, quantifiable, and reproducible method for monitoring shunt function in hemodialysis patients.

Methods: Fifty maintenance hemodialysis outpatients with native AVFs and a history of frequent or scheduled vascular access interventions (VAIVT) at our clinic were recruited. Vascular sounds were recorded using the AMI-SSS01 by clinical engineers with varied experience, reflecting routine clinical diversity. Recordings were taken at two standardized sites: the arteriovenous anastomosis and the venous needle puncture site. The probe was gently placed on the skin, relying on its own weight to minimize pressure-related variability. Concurrently, duplex ultrasonography measured brachial artery flow volume (FV), used as a reference. Audio signals were processed using short-time Fourier transform (STFT) to extract spectral amplitude features. Ridge regression was then used to predict FV from the recorded sound profiles.

Results: The AMI-SSS01 consistently captured stable vascular sound waveforms across all patients, regardless of examiner experience, confirming its usability in routine clinical settings. At the venous puncture site, predicted FV values showed good correlation with measured values ($R^2 > 0.5$). In contrast, the anastomosis site showed lower accuracy ($R^2 < 0.3$), likely due to turbulence and complex flow patterns in that region. Some waveform patterns also appeared to reflect early functional decline, even in the absence of symptoms.

Conclusion: Compared to conventional stethoscopes, the AMI-SSS01 provides a standardized, reproducible method of auscultation with reduced operator variability. Visualized vascular sound profiles at defined sites may support both qualitative assessment and quantitative modeling. The ability to estimate flow volume via spectral analysis suggests clinical utility for routine vascular access monitoring in dialysis care.

Keywords：Vascular Access Surveillance, Arteriovenous Fistula Assessment , Hemodialysis Monitoring, Clinical Auscultation, Functional Decline Detection



Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250392

Trends and Practices in Early versus Late Initiation of Renal Replacement Therapy in South Korea and Taiwan

Soie Kwon[1]; Ping-Hsun Wu[2]; Dong Ki Kim[3]; Yon Su Kim[3]; Chun Soo Lim[4]; Ming-Yen Lin[5]; Yi-Wen Chiu[5]; Shang-Jyh Hwang[2]; Jung Pyo Lee[4]

[1] Division of Nephrology, Department of Internal Medicine, Chung-Ang University Seoul Hospital, Seoul, Republic of Korea

[2] Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Chung-Ho Memorial Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan.

[3] Division of Nephrology, Department of Internal Medicine, Seoul National University's Hospital, Seoul, Republic of Korea

[4] Division of Nephrology, Department of Internal Medicine, Boramae Medical Center, Seoul, Republic of Korea

[5] Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan

Abstract

Identifying the optimal timing for Renal Replacement Therapy (RRT) initiation is challenging due to various clinical factors. This leads to significant variability in initiation times among nephrologists, which may vary by country and era. Our study compares RRT initiation practices in South Korea and Taiwan, focusing on changes in the estimated Glomerular Filtration Rate (eGFR) from 2000 to 2022.

A retrospective cohort study was conducted in two tertiary hospitals in South Korea and one tertiary hospital in Taiwan. The lowest eGFR within this period defined the initiation point. RRT modalities included hemodialysis, peritoneal dialysis, and kidney transplantation. We restricted the study population to patients with an eGFR of less than 15 mL/min/1.73m² at the initiation of RRT.

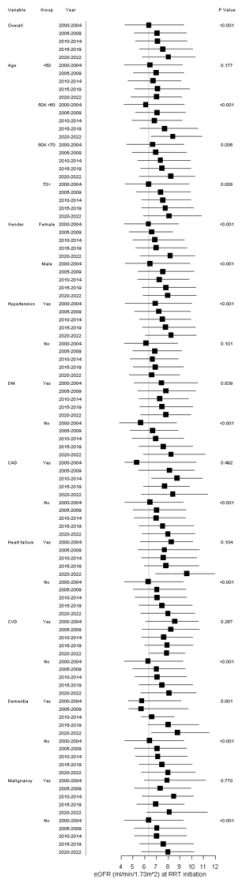
A total of 8,244 patients were enrolled (South Korea: 5,967; Taiwan: 2,277). The median eGFR at the initiation of RRT was significantly lower in the Taiwanese cohort (3.9 mL/min/1.73 m² [IQR 3.1–5.0]) compared to the Korean cohort (7.5 mL/min/1.73 m² [IQR 5.4–10.5]) ($p < 0.001$). In the Korean cohort, the median eGFR at RRT initiation increased steadily over time, from 7.3 mL/min/1.73 m² [IQR 4.7–12.0] in 2000–2004 to 8.1 mL/min/1.73 m² [IQR 5.8–10.5] in 2020–2022 (p for trend < 0.001). In contrast, no significant temporal change was observed in the Taiwanese cohort, with the median eGFR remaining stable from 4.0 mL/min/1.73 m² [IQR 3.1–5.2] in 2005–2009 to 4.1 mL/min/1.73 m² [IQR 3.2–5.1] in 2020–2022 (p for trend = 0.919)

Temporal trends in eGFR at RRT initiation were further evaluated across various subgroups. No statistically significant changes were identified in any subgroup within the Taiwanese cohort. Conversely, the Korean cohort exhibited a general upward trend in eGFR at RRT initiation across most subgroups, with significant increases particularly observed among patients with hypertension and those without diabetes, cardiovascular disease, or heart failure (Figure 2). Furthermore, in a multivariable Cox proportional hazards analysis assessing 3-year mortality following dialysis initiation, Taiwanese patients within the eGFR 5–10 mL/min/1.73 m² category demonstrated a significantly higher mortality risk compared to their Korean counterparts (adjustedHR 1.40, 95% CI 1.087–1.797; p = 0.009).

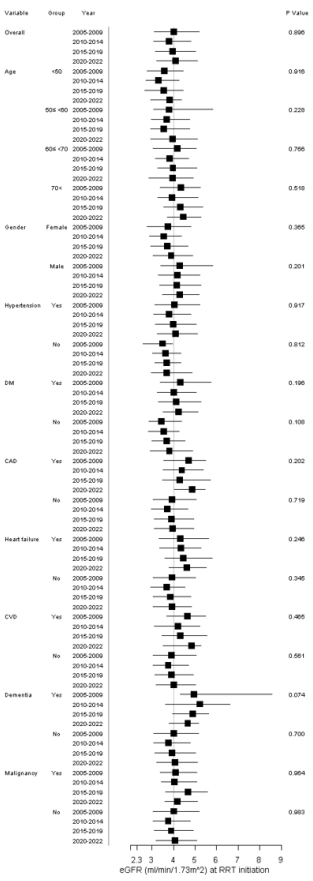
The study reveals a lower eGFR threshold for dialysis initiation in Taiwan compared to South Korea, with trends indicating an earlier RRT initiation in Korean patients in recent years. Notably, in terms of all-cause mortality, these findings underscore the need for further evaluation of the potential benefits of early RRT initiation in patients with an eGFR between 5 and 10 mL/min/1.73 m².

Keywords：RRT initiation, South Korea, Taiwan, eGFR, Mortality

(A) South Korea



(B) Taiwan



Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250990

Survival Outcomes of Hemodialysis and Peritoneal Dialysis: A Nationwide Cohort Study in Taiwan

Teng Jen-Hao[1]; Jia-Sin Liu[2]; Ming-Yen Lin[1]; Yi-Wen Chiu[1,3]

[1] Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan

[2] Institute of Population Health Sciences, National Health Research Institutes, Miaoli, Taiwan

[3] Faculty of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Abstract

Background: Long-term survival differences between hemodialysis (HD) and peritoneal dialysis (PD) remain inconclusive, mainly due to unresolved selection bias in observational studies and the absence of definitive randomized trials. Given recent advances in medical care and evolving patient profiles, we conducted a nationwide cohort study in Taiwan to evaluate whether dialysis modality independently influences long-term mortality among incident dialysis patients.

Methods: We assembled a retrospective cohort study to compare all-cause mortality between patients initiating HD and PD who received maintenance dialysis for more than 3 months in Taiwan from 2013 to 2020. Patients were followed until death or December 31, 2021, whichever occurred first. To address potential selection bias, we identified a subgroup of HD patients with planned initiation—defined as starting HD without the use of a temporary catheter (planned-HD)—for additional comparison with PD patients. Mortality risk was assessed using Cox proportional hazards regression. Baseline characteristics, including age, sex, income level, geographic location, comorbidities, and disease severity, were balanced for comparisons between HD and PD. In addition, 1:1 propensity score (PS) matching was applied for comparisons between the planned-HD and PD groups. Three sets of comparisons were conducted: (1) HD vs. PD in the full cohort, (2) planned-HD vs. PD before PS matching, and (3) planned-HD vs. PD after 1:1 PS matching.

Results: A total of 100,995 incident dialysis patients were enrolled, including 90,399 receiving HD (mean age 68.0 ± 13.5 years, 55.7% male, 50.1% with diabetes) and 10,596 receiving PD (mean age 56.8 ± 15.5 years, 53.7% male, 35.0% with diabetes). Among the HD group, 45,130 patients met the definition of planned-HD (mean age 66.1 ± 12.9 years, 59.0% male, 50.4% with diabetes). Over a mean follow-up of 3.3 years, death occurred in 36,175, 15,673, and 3,035patients in the HD, planned-HD, and PD group, respectively. After baseline adjustment, the HD group showed a significantly lower mortality risk compared to the PD group (adjusted hazard ratio [HR] = 0.82; 95% confidence interval [CI], 0.79–0.85; $P < 0.001$). This survival advantage was more pronounced in the planned-HD group when compared with the PD group, both before matching (adjusted HR = 0.67; 95% CI, 0.65–0.70; $P < 0.001$) and after propensity score matching, with 7,433 patients in each group (adjusted HR = 0.66; 95% CI, 0.62–0.71; $P < 0.001$).

Conclusion: Based on 2013–2021 data in Taiwan, HD was associated with better long-term survival than PD after adjusting for baseline characteristics, with a greater benefit observed in patients with planned HD initiation.

Keywords：Hemodialysis, Peritoneal dialysis, Survival

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20251115

Analysis of the Novel LDL Apheresis Option, Rheocarna, for Chronic Limb-Threatening Ischemia in Hemodialysis Patients at Our Facility

Yoshihiro Arimura[1,5]; Kanna Watanabe[1]; Aya Sato[1]; Tsunee Yamato[1]; Eiichiro Sakagawa[1]; Takashi Yasuda[1]; Yuhta Oyama[1]; Shinya Kaname[1,5]; Yui Kato[2]; Keiko Inaba[3]; Kazue Saito[3]; Tatsunori Yanagimachi[4]; Taketo Motoyama[4]; Norihiko Ohura[6]

[1] Department of Internal Medicine, Kichijoji Asahi Hospital, Musashino City, Japan

[2] Department of Rehabilitation, Kichijoji Asahi Hospital, Musashino City, Japan

[3] Department of Nursing, Kichijoji Asahi Hospital, Musashino City, Japan

[4] Department of Clinical Engineering, Kichijoji Asahi Hospital, Musashino City, Japan

[5] Department of Nephrology and Rheumatology, Kyorin University School of Medicine, Mitaka City, Japan

[6] Department of Plastic, Reconstructive and Aesthetic Surgery, Kyorin University School of Medicine, Mitaka City, Japan

Abstract

Background/Aims: Chronic hemodialysis patients with Chronic Limb-Threatening Ischemia (CLTI) often face lower limb and/or toe amputations, and both their short-term and long-term prognoses are generally poor. In 2021, Rheocarna Therapy was approved for insurance coverage in Japan as a novel low-density lipoprotein (LDL) apheresis therapeutic option for CLTI. This study aimed to assess the efficacy and safety of Rheocarna therapy in hemodialysis patients with CLTI.

Subjects: Seventeen cases (n=191 treatments) of Rheocarna therapy performed at our facility between May 2022 and October 2024 were included. The average age was 72 years, with a male-to-female ratio of 2.4:1. The underlying diseases that led to dialysis initiation were diabetes in 12 cases, nephrosclerosis in 2 cases, and other conditions in 3 cases. Wound assessment was performed using the WIFI classification, with 6 cases graded as grade 3, 8 as grade 2, and 3 as grade 1.

Methods: This was a retrospective case series study. Safety during Rheocarna therapy was evaluated by analyzing blood pressure, pulse fluctuations, subjective symptoms, and blood clotting within the dialysis circuit. Therapeutic effects were assessed by analyzing changes in serum LDL-cholesterol, fibrinogen, CRP levels, nutritional status, and the progression of wound healing. Additionally, medical cooperation in the management of Rheocarna therapy was also evaluated.

Results: A decrease of more than 30 mmHg in blood pressure from the start of Rheocarna treatment was observed in 11 cases (64.7%). Heparin was used as the anticoagulant in all cases, with blood clotting in the circuit observed in 3 instances (1.6%; 3/191 treatments). LDL-cholesterol removal rate was 26±7% (n=34, $p<0.001$), fibrinogen removal rate was 22±6% (n=40, $p<0.001$), and CRP removal rate was 51±11% (n=35, $p<0.001$). Of the 17 cases, 7 (41%) showed wound healing, and 4 (24%) showed healing tendencies. Eight cases were newly initiated at our facility, and 9 cases continued treatment after initiation at a regional core hospital. Fourteen patients (82.4%) were discharged to a dialysis clinic where Rheocarna treatment continued.

Conclusion: The effect of Rheocarna therapy appeared to involve a reduction in blood viscosity and suppression of inflammation. It can be safely performed for hemodialysis patients with CLTI and is effective in promoting wound healing.

Keywords：Chronic hemodialysis, Chronic Limb-Threatening Ischemia (CLTI), The Novel LDL Apheresis Option, Rheocarna,

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250084

Optimizing Dialysis Potassium Removal: Impact of Decreasing Dialysate Potassium Profile on Hyperkalemic ESRD Patients

Abhilash Chandra[1]; Namrata Rao S[1]; Majibullah Ansari[2]

[1] Department of Nephrology, Dr RMLIMS, Lucknow, India

[2] Department of Nephrology, PMCH, Patna, India

Abstract

Background:

The optimal dialysate potassium concentration for patients with hyperkalemia undergoing maintenance hemodialysis remains a topic of debate. While low potassium dialysate may effectively reduce serum potassium, it can also create a steep potassium gradient, potentially increasing the risk of arrhythmic events. This study aimed to evaluate the impact of decreasing dialysate potassium profiling on serum potassium reduction and associated cardiac complications.

Materials and Methods:

Patients aged 18–60 years with end-stage renal disease and predialysis hyperkalemia were randomized into two groups who were on twice-weekly maintenance hemodialysis. Group A received a dialysate with 2 mEq/L potassium during the first hour, followed by 0 mEq/L for the remaining three hours. Group B received a constant 2 mEq/L potassium dialysate for all four hours. Serum potassium levels were measured before dialysis and hourly during treatment. Cardiac rhythm was monitored for arrhythmic events.

Results:

Of 145 patients screened, 60 were randomized (30 per group). The majority were male (66.7% in Group A; 56.7% in Group B), with over 50% having diabetes and 85% hypertension, indicating high cardiovascular risk. Predialysis serum potassium levels were comparable (Group A: 6.00 ± 0.3 mEq/L; Group B: 5.98 ± 0.34 mEq/L). Postdialysis, Group A achieved a significantly lower serum potassium level (3.48 ± 0.22 mEq/L) compared to Group B (3.72 ± 0.42 mEq/L; p = 0.008).[Table 1] Ventricular ectopy occurred in two patients in Group A and one in Group B, all managed conservatively and resolved within 30 minutes of the end of the dialysis session.

Conclusion:

Dialysate potassium profiling effectively achieved greater reduction in serum potassium levels compared to a fixed dialysate potassium concentration, with a comparable incidence of minor arrhythmic events. This approach may offer an efficient strategy for managing hyperkalemia in maintenance hemodialysis patients.

Keywords：Hemodialysis, potassium, arrhythmia, hyperkalemia

Table 1 Serum potassium at specific time intervals (all sessions of 4 hours each)

	Arm	Mean	Std. Deviation	P value	95%Confidence Interval
Pre dialysis	Group A	6.00	0.33	0.804	-1.154 to 0.198
	Group B	5.98	0.34		
First hour	Group A	5.19	0.33	0.805	-0.256 to 0.200
	Group B	5.22	0.52		
Second hour	Group A	4.25	0.39	0.004	-0.670 to -0.179
	Group B	4.68	0.54		
Third hour	Group A	3.80	0.32	0.012	-0.555 to -0.117
	Group B	4.13	0.50		
Fourth hour	Group A	3.48	0.22	0.008	-0.413 to -0.067
	Group B	3.72	0.42		
Next session Pre HD	Group A	5.26	0.32	0.0012	-0.363 to -0.057
	Group B	5.52	0.27		

HD: Hemodialysis

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250737

Psychometric properties of the Pittsburgh Sleep Quality Index in people receiving haemodialysis

Ginger Chu[1,2,3]

[1] School of Nursing and Midwifery, University of Newcastle

[2] Department of Nephrology, John Hunter Hospital

[3] Asthma and breathing program, Hunter Medical Research Institute

Abstract

Background

Sleep is an important outcome for individuals with chronic kidney disease undergoing haemodialysis. However, the applicability of commonly used instruments for assessing sleep quality in this population remains unclear. We evaluated the validity and reliability of the Pittsburgh Sleep Quality Index (PSQI) in a cohort of people receiving haemodialysis treatments.

Method

This study included adults with chronic kidney disease who were receiving haemodialysis at four health facilities across three states in Australia during the study period from August 2024 to March 2025. Participants were asked to complete a survey containing the PSQI, which comprises seven components (subjective sleep quality, sleep latency, sleep efficiency, sleep duration, sleep disturbance, use of sleep medication and daytime dysfunction), assessing different aspects of sleep quality. The psychometric properties were examined using exploratory factor analysis and confirmatory factor analysis to assess validity. Cronbach's alpha was calculated to assess the internal consistency.

Results

Of 107 participants, the mean age was 61 years, 72% were males, and the majority received dialysis three times a week (84%). Exploratory factor analysis revealed the presence of three factors in the PSQI: sleep disruptions, sleep medication, and sleep regulation, collectively accounting for 72% of the variance. Confirmatory factor analysis confirmed the two-factor model, with sleep disruption and sleep regulation as the best-fitting model. Sleep medication did not correlate well with the other components. Reliability data indicated good internal consistency (α=0.72).

Conclusions

This study demonstrated that PSQI has excellent psychometric properties when applied to a haemodialysis population. The findings support the overall reliability of the PSQI, while highlighting potential limitations in certain components, such as the use of sleep medication. Additional research is needed to establish the appropriateness of the short version of the PSQI, excluding questions about sleep medication. Future studies should also validate the test-retest reliability of the PSQI to determine its consistency over time.

Keywords：Pittsburgh Sleep Quality Index, Haemodialysis, Chronic kidney disease, Psychometric property, Validity, Reliability, Sleep quality.

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20250879

Long-Term Costs and Hospitalization Rates of Planned Hemodialysis Versus Peritoneal Dialysis in Taiwan: A National Cohort Study

Ho-Ting Hsuan[1]; Jia-Sin Liu; Ming-Yen Lin[1]; Yi-Wen Chiu[1,3]

[1] Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan

[2] Institute of Population Health Sciences, National Health Research Institutes, Miaoli, Taiwan

[3] Faculty of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Abstract

Background

Peritoneal dialysis (PD) offers a cost advantage over hemodialysis (HD) in many settings. Taiwan's National Health Insurance (NHI) offers higher reimbursements to promote PD use. However, the long-term cost-effectiveness of this policy remains uncertain. To address this, we used the national NHI database to compare long-term healthcare expenditures and hospitalization rates (HRs) between HD and PD in incident dialysis patients.

Methods

We conducted a retrospective cohort study using Taiwan's NHI database to compare medical expenditures and HRs between HD and PD patients initiating maintenance dialysis (≥3 months) from 2013 to 2020. Follow-up continued until death or December 31, 2021. To reduce bias from urgent initiation, planned HD—defined as initiation without a temporary catheter—was identified. Propensity score (PS) matching (1:1) based on demographics and comorbidities was performed. Comparisons included (1) HD vs. PD and (2) planned HD vs. PD, both before and after matching.

Results

A total of 100,995 incident dialysis patients were enrolled, including 90,399 HD (mean age: 68.0 ±13.5 years; 55.7% male; 50.1% with diabetes mellitus (DM)) and 10,596 PD (mean age: 56.8 ± 15.5 years; 53.7% male; 35.0% with DM). Among the HD group, 58,679 patients met the definition of planned HD (mean age: 66.1 ± 12.9 years; 59.0% male; 50.4% with DM). The average annual healthcare expenditures were significantly higher for HD than for PD (877,135 vs.712,056 NHI points), with HRs also higher in HD than in PD (2.3 vs. 1.7 per 1,000 patient-years).
After PS matching, 7,433 patients were selected from each group. Before matching, planned HD was associated with higher average annual healthcare expenditures than PD (824,687 vs.712,056 NHI points) and slightly higher HR (1.8 vs. 1.7 per 1,000 patient-years). After matching, planned HD still has higher expenditures than PD (784,594 vs. 708,685 NHI points; $p < 0.001$), but showed slightly lower HRs (1.5 vs. 1.7 per 1,000 patient-years; $p < 0.001$). When adjusted for reimbursement rates (HD: ~0.9 NTD/NHI point; PD: 1 NTD/NHI point), the annual costs of planned HD and PD became nearly equivalent.

Conclusion

Our study found PD was associated with slightly lower annual healthcare expenditures than planned HD, based on NHI point-based reimbursement. Once the conversion rate from NHI points to dollars falls below 0.9, HD would become less expensive than PD. However, PD patients had a higher HR. These findings highlight the trade-off between economic and clinical outcomes and inform future healthcare policy and resource allocation for ESKD management.

Keywords：Hemodialysis/Peritoneal Dialysis/Cost/Hospitalization Rate

Oral Communications：Hemodialysis (HD)
Abstract Submission No.：APCN20251011

Effective Removal of Cytokines Using Polyacrylonitrile (AN69) Membranes Compared to Polysulfone (PS) and Polymethyl Methacrylate (PMMA) Membranes During the Initiation of Hemodialysis

KOJI OKAMOTO[1]; Maho Akiu[1]; Akiko Furukawa[1]; Mariko Miyazaki[1]; Tetsuhiro Tanaka[1]
[1] Department of Nephrology, Tohoku University Graduate School of Medicine, Sendai City, Japan

Abstract
Introduction: Polyethyleneimine-treated polyacrylonitrile (AN69ST) and polymethyl methacrylate (PMMA) membranes have been reported to exhibit superior cytokine clearance in septic conditions. In patients with chronic kidney disease (CKD), cytokine levels gradually increase with disease progression, contributing significantly to inflammation, malnutrition, cardiovascular disease, and poor prognosis.
Although cytokine levels are elevated in end-stage renal disease (ESRD), they remain substantially lower than those observed in septic shock.
This study aimed to evaluate whether three different dialysis membranes—AN69, PMMA, and polysulfone (PS) can effectively remove cytokines that are only mildly elevated, close to normal physiological levels.

Purpose: To compare the cytokine removal capacity of three membrane types (AN69, PMMA, and PS) in patients undergoing initiation of maintenance hemodialysis without acute illness.

Methods: We conducted a prospective, randomized controlled study in patients scheduled to initiate maintenance hemodialysis without any acute or inflammatory comorbidities.
Patients were randomly assigned in a 1:1:1 ratio to receive hemodialysis using one of the three membrane types: AN69, PMMA, or PS. The primary outcomes were changes in plasma interleukin-6 (IL-6) and high-sensitivity C-reactive protein (hsCRP) levels before and after dialysis.

Results: In the AN69, PS, and PMMA groups, the average ages were 61.5 ± 15.5, 66.3 ± 13.3, and 65.3 ± 12.3 years, respectively. Neutrophil counts in the AN69 and PMMA groups decreased during the first hemodialysis (HD) session (AN69 13.4%, PMMA 23.6%, and PS 3.5% reduction). In the AN69 group, IL-6 levels did not increase during HD (2.7 ± 9.1%), whereas they increased in the PS and PMMA groups (PS 10.2 ± 26.0%, PMMA 16.5 ± 30.0%). Additionally, hs-CRP decreased at the second session in the AN69 group; however, hs-CRP increased in the PS and PMMA groups (PS 9.5%, PMMA 26.9%).

Conclusion: The AN69 membrane demonstrated superior removal of mildly elevated cytokines during the early phase of hemodialysis initiation, leading to a decrease in subsequent

Keywords：Polyacrylonitrile, AN69, hemodialysis