



## Kidney Research and Clinical Practice

journal homepage: <http://www.krcp-ksn.com>  
 Contents lists available at [ScienceDirect](http://www.sciencedirect.com)



## Original Article

## Technique failure in Korean incident peritoneal dialysis patients: a national population-based study

Shina Lee <sup>1</sup>, Hyunwook Kim <sup>2</sup>, Kyoung Hoon Kim <sup>3</sup>, Hoo Jae Hann <sup>4</sup>, Hyeong Sik Ahn <sup>5</sup>,  
 Seung-Jung Kim <sup>1</sup>, Duk-Hee Kang <sup>1</sup>, Kyu Bok Choi <sup>1</sup>, Dong-Ryeol Ryu <sup>1,\*</sup>

<sup>1</sup> Department of Internal Medicine, School of Medicine, Ewha Womans University, Seoul, Korea

<sup>2</sup> Department of Internal Medicine, Yonsei University College of Medicine, Gangnam Severance Hospital, Seoul, Korea

<sup>3</sup> Department of Public Health, Graduate School, Korea University, Seoul, Korea

<sup>4</sup> Ewha Medical Research Institute, School of Medicine, Ewha Womans University, Seoul, Korea

<sup>5</sup> Department of Preventive Medicine, College of Medicine, Korea University, Seoul, Korea

## A B S T R A C T

*Article history:*

Received 21 March 2016

Received in revised form

16 July 2016

Accepted 4 August 2016

Available online xxx

*Keywords:*

Peritoneal dialysis

Risk factors

Technique failure

**Background:** Technique failure is an important issue for peritoneal dialysis (PD) patients. In this study, we aimed to analyze technique failure rate in detail and to determine the predictors for technique failure in Korea.

**Methods:** We identified all patients who had started dialysis between January 1, 2005, and December 31, 2008, in Korea, using the Korean Health Insurance Review and Assessment Service database. A total of 7,614 PD patients were included, and the median follow-up was 24.9 months.

**Results:** The crude incidence rates of technique failure in PD patients were 54.1 per 1,000 patient-years. The cumulative 1-, 2-, and 3-year technique failure rates of PD patients were 4.9%, 10.3%, and 15.6%, respectively. However, those technique failure rates by Kaplan–Meier analysis were overestimated compared with the values by competing risks analysis, and the differences increased with the follow-up period. In multivariate analyses, diabetes mellitus and Medical Aid as a crude reflection of low socioeconomic status were independent risk factors in both the Cox proportional hazard model and Fine and Gray subdistribution model. In addition, cancer was independently associated with a lower risk of technique failure in the Fine and Gray model.

**Conclusion:** Technique failure was a major concern in patients initiating PD in Korea, especially in diabetic patients and Medical Aid beneficiaries. The results of our study offer a basis for risk stratification for technique failure.

Copyright © 2016. The Korean Society of Nephrology. Published by Elsevier. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Introduction**

There has been a significant increase in the number of incident dialysis patients over the past decade in Korea.

\* Corresponding author. Department of Internal Medicine, School of Medicine, Ewha Womans University, 911-1 Mok-dong, Yangcheon-gu, Seoul, 158-710, Korea.

E-mail address: [drryu@ewha.ac.kr](mailto:drryu@ewha.ac.kr) (D-R Ryu).

<http://dx.doi.org/10.1016/j.krcp.2016.08.002>

2211-9132/Copyright © 2016. The Korean Society of Nephrology. Published by Elsevier. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

According to the 2012 annual report from the Korean nationwide registry program, the number of new end-stage renal disease (ESRD) patients with hemodialysis (HD), peritoneal dialysis (PD), or kidney transplantation (KT) was 8,811 (169.8 per million population [PMP]), 923 (17.8 PMP), or 1,738 (33.5 PMP), respectively [1].

Notably, the number of new patients on PD has been decreasing since 2007, whereas the number of those on HD and

KT has been increasing continuously, consistent with the trend observed in the United States [2]. Possible reasons for the decreasing rate of choosing PD as an initial dialysis therapy could include increased number of HD centers, better outcome in HD patients [3], and concerns about PD-related complications including peritonitis. Moreover, high technique failure rate in PD patients has contributed to the decreasing number of prevalent PD [1].

ESRD patients on dialysis suffer not only from higher mortality compared with the general population [4] but also from high morbidity due to various cardiovascular diseases, cancer, and technique failure. Technique failure can induce medical stress including subsequent mortality and additional cost, especially in the earlier period after initiation of PD [5–7]. Accordingly, there has been a continuous effort to analyze the causes and predictors of technique failure. Nevertheless, there are still controversial issues for technique failure risk factors because of different medical and social environments across countries. Although a population-based study for technique failure was reported in Western countries, there has not been a similar study in Asian countries. Because there are significant differences between Western and Asian ESRD patients in etiology of renal failure and mortality rates [8], it is likely that there are different characteristics for technique failure in Asian patients.

In addition, it is known that there are various competing risks in the research for outcomes in PD, and the risk of the outcome of interest may be overestimated without consideration of these competing risks [9,10].

In this study, we aimed to analyze technique failure rate in PD in detail and to determine the specific predictors for technical failure by both conventional analysis and competing risks analysis, using the Korean Health Insurance Review and Assessment Service (HIRA) database, which is a nationwide, population-based data set.

## Methods

### Data source and study population

We performed a retrospective cohort study that used information from the Korean HIRA database. In Korea, all medical care expenses for dialysis are reimbursed by HIRA. Therefore, we were able to collect all information from every ESRD patient and analyze data which represented the entire Korean population. We initially identified all the incident dialysis patients who had started PD therapy from January 1, 2005, to December 31, 2008, using detailed methods described elsewhere [3]. Among them, the patients who were younger than 18 years or the patients who survived for less than 90 days from the date of dialysis initiation were excluded. All included patients were followed up until December 31, 2009. The time to death was confirmed by the Certificate Database, which records the reasons for changes in eligibility for the health security system including death or emigration, as well as by the National Health Insurance Claims Database. Comorbidities of the participants were identified by reviewing their medical history during the last 1 year before the initiation of dialysis therapy. The list of analyzed comorbidities was determined on the basis of suggestions by Charlson et al [11], and International Classification of Diseases, 10<sup>th</sup> Revision, codes were used according to the proposed algorithms by Quan et al [12].

### Definition

Technique failure was defined as transference from a specific modality of dialysis therapy to another modality that lasted for 30 days or more, and the end point of this study was time to technique failure. We considered the dialysis modality at day 90 as the initial dialysis modality and incorporated all events of shifting modality afterward. Most of the acutely ill patients who need urgent initiation of dialysis start dialysis preferentially with HD. Because we could not investigate the cause of dialysis initiation, education on dialysis modalities *a priori*, and referral timing, we evaluated the technique failure rate in “long-term dialysis” patients maintained on dialysis for 3 months or more. In addition, although some patients switched dialysis modalities multiple times, we only included the first event of technique failure for the entire analysis.

### Statistical analysis

All data are expressed as mean  $\pm$  standard deviation or number (percent) unless otherwise specified. A *P* value  $< 0.05$  was considered statistically significant.

To assess technique failure-free survival, we used Kaplan–Meier survival curves with the log-rank test to compare the differences. Patients were censored at KT, death, or on December 31, 2009. Cox proportional hazards analysis was performed to determine predictive factors, and significant variables in univariate analyses were included in multivariate analysis with a threshold of 0.10 for retention. In addition, to compare the technique failure-free survival rates according to the dialysis initiation year, we constructed data sets in which the patients were followed up to 2 years to let each year cohort have the same follow-up period.

Next, we performed competing risks analysis because the Kaplan–Meier method is known to overestimate the probabilities of each event when there are competing events in PD patients [10,13]. In our analysis, death and KT are considered to be competing events for technique failure. To explore the relationship between covariates and the cumulative incidences of each event, the Fine and Gray regression model was used. In addition, we compared results by competing risks analysis with those obtained by Kaplan–Meier analysis.

The statistical analyses were performed using the statistic software SPSS, version 18.0 (SPSS Inc., Chicago, IL, USA), and R 3.1.2 (R Foundation for Statistical Computing, Vienna, Austria) including *cmprsk* package.

This investigation was conducted according to the principles expressed in the Declaration of Helsinki. The Institutional Review Board at the HIRA approved the survey of the study population.

## Results

### Baseline characteristics of the participants

A total of 7,614 eligible patients who started PD between January 1, 2005, and December 31, 2008, were analyzed. At the initiation of dialysis treatment, the mean patient age was  $54.5 \pm 13.8$  years; 56.3% of the patients were male, and 50.4% of the patients had diabetes. A detailed description of characteristics among PD patients is shown in Table 1.

Download English Version:

<https://daneshyari.com/en/article/8773983>

Download Persian Version:

<https://daneshyari.com/article/8773983>

[Daneshyari.com](https://daneshyari.com)