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Special Article

Current characteristics of dialysis therapy in Korea: 2015 registry data focusing on elderly patients

Dong-Chan Jin [1,*], Sung-Ro Yun [2], Seoung Woo Lee [3], Sang-Woong Han [4], Won Kim [5], Jongha Park [6]

[1] Department of Internal Medicine, The Catholic University of Korea, Seoul, Korea
[2] Department of Internal Medicine, Konyang University, Daejeon, Korea
[3] Department of Internal Medicine, Inha University, Incheon, Korea
[4] Department of Internal Medicine, Hanyang University, Seoul, Korea
[5] Department of Internal Medicine, Chonbuk National University, Jeonju, Korea
[6] Department of Internal Medicine, Ulsan University, Ulsan, Korea

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Abstract

Because of increases in the elderly population and diabetic patients, the proportion of elderly among dialysis patients has rapidly increased during the last decades. The mortality and morbidity of these elderly dialysis patients are obviously much higher than those of young patients, but large analytic studies about elderly dialysis patients' characteristics have rarely been published. The registry committee of the Korean Society of Nephrology has collected data about dialysis therapy in Korea through an Internet online registry program and analyzed the characteristics. A survey on elderly dialysis patients showed that more than 50% of elderly (65 years and older) patients had diabetic nephropathy as the cause of end-stage renal disease, and approximately 21% of elderly dialysis patients had hypertensive nephrosclerosis. The proportion of elderly hemodialysis (HD) patients with native vessel arteriovenous fistula as vascular access for HD was lower than that of young (under 65 years) HD patients (69% vs. 80%). Although the vascular access was poor and small surface area dialyzers were used for the elderly HD patients, the dialysis adequacy data of elderly patients were better than those of young patients. The laboratory data of elderly dialysis patients were not very different from those of young patients, but poor nutrition factors were observed in the elderly dialysis patients. Although small surface area dialyzers were used for elderly HD patients, the urea reduction ratio and Kt/V were higher in elderly HD patients than in young patients.

Introduction

The number of end-stage renal disease (ESRD) patients under maintenance dialysis therapy has increased very rapidly in recent decades because of the increase of the elderly population and diabetic patients. The increase of dialysis patients in Korea was approximately 7–10% per year during several

* Corresponding author. Department of Internal Medicine, St. Vincent's Hospital, The Catholic University of Korea, 93, Jungbu-daero, Paldal-gu, Suwon-si, Gyeonggi-do 16247, Korea.
E-mail address: jindongc@catholic.ac.kr (D-C Jin).

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recent years, and the proportion of diabetic and elderly dialysis patients also increased [1–4]. The mortality and morbidity of these elderly dialysis patients are obviously much higher than those of young patients, but a large analytic study about elderly dialysis patients' characteristics has rarely been published.

The Korean Society of Nephrology (KSN) performed a nationwide official survey program about dialysis therapy through an Internet online registry system. We, the registry committee of KSN, analyzed the characteristics, especially focused on elderly dialysis patients.

Methods of data collection

The Internet questionnaire for dialysis patient registration is run by KSN all year round, and it includes dialysis center information and patient personal medical information, including vascular access for hemodialysis (HD), dialysis adequacy performance data, erythropoietin (EPO) dose, phosphate binders, laboratory data, and rehabilitation status. The registry program also has a graphic evaluation function of dialysis adequacy: single-pool Kt/V (spKt/V), normalized protein catabolic rate (nPCR), and a peritoneal equilibrium test. Every KSN member can access anytime the dialysis adequacy data of their own dialysis center, which could be of some help for dialysis prescription. The KSN ESRD registry response rate with patients' individual data was 67.1% in 2015.

Dialysis data from the KSN ESRD patient registry

Prevalence and incidence of ESRD

At the end of 2015, the ESRD patient number in Korea was reported as 87,014, of which 62,634 were HD patients, 7,352 were peritoneal dialysis (PD), and 17,028 were kidney transplantation (KT) patients (Fig. 1A). The patient per million population was HD 1,216, PD 143, KT 331, and overall 1,689. In addition, the proportions of HD, PD, and KT among renal replacement modalities were 72%, 8%, and 20%, respectively, at the end of 2015 (Fig. 1B).

The number of new patients who initiated dialysis in 2015 was estimated at 12,865 (12,011 in HD, 854 in PD, and overall 250 per million population).

Underlying causes of ESRD

The most common underlying cause of ESRD was diabetic nephropathy, which accounted for 48.4% of new ESRD patients in 2015. The other common causes were hypertensive nephrosclerosis (20.2%) and chronic glomerulonephritis (8.5%). The proportion of diabetic patients in Korea was the highest in the world except for a couple of city states according to an international comparison published in the annual report of United States Renal Data System [5]. The diabetic patient proportion rapidly increased from 1990 to 2000 but slowly increased from 2000 to 2015 in Korea (Fig. 1C).

Dialysis centers and dialysis machines

The number of dialysis centers in Korea was 846, from which the non-KSN member centers (approximately 50 centers) had been excluded. The HD machine number was estimated to be 22,750 at the end of 2015. The average machine number per center was approximately 27, and the HD patients per HD machine ratio was 2.8. Approximately 44% of HD patients were under maintenance dialysis therapy at private clinics, 38% of patients were at a general hospital, and 18% of patients were at a university hospital. During the recent couple of years, the proportion of general hospitals was increasing because of the increase of dialysis facilities in nursing hospitals, which care mostly for elderly dialysis patients.

Dialysis patient characteristics

Gender ratio

The gender ratio (male vs. female) was 58%:42% in HD patients and 56%:44% in PD patients. The male dialysis patient number was much higher than female patient number in comparison to the general population. These ratios had no interval change during 20 years and were quite similar to the United States and Japan [5,6].

ABO blood type

The ABO blood type ratio (A:B:AB:O) was 35%:27%:11%:27%, which was just the same as the general population.

Hepatitis B and C

Hepatitis B antigen positivity was 6%, and hepatitis C antibody positivity was 4% in HD patients in 2015. The percentages in PD patients were 6% and 3%, respectively.

Medical insurance status

Approximately 77% of dialysis patients were covered by national health insurance, and 19% were under medical aid programs in Korea at the end of 2015. The patients under medical aid were slowly decreasing.

Age

The average age of all dialysis patients was 60.8 ± 14.0 years in 2015, which had steadily increased from 55.2 years in 2005. The average age was 61.6 ± 13.8 years in HD patients and 55.7 ± 14.5 years in PD patients. The percentage of elderly patients (older than 65 years) was 41.9% in 2015, which had markedly increased from 28% in 2005. The average age of diabetic dialysis patients was 63.0 ± 12.3 years, that of hypertensive nephrosclerosis patients was 62.2 ± 13.8 years, and that of chronic glomerulonephritis patients was 55.1 ± 15.0 years in 2015 (Fig. 1D).

Duration of dialysis maintenance

Approximately 18% of HD patients were under dialysis therapy for more than 10 years, 27% for 5–10 years, and 12% for less than 1 year. Only 12% of PD patients were under dialysis for 10 years or more (Fig. 1E). In addition, approximately 9% of diabetic HD patients were under dialysis for over 10 years, but 26% of nondiabetic HD patients were under dialysis for 10 years or more. These data suggested that the survival of HD and nondiabetic patients was longer than that of PD and diabetic patients.

Body mass index

The average body mass index (the body weight in kilograms divided by square of the body height in meters) of HD patients was 22.3 ± 3.7 kg/m^2 and that of PD patients was