



# Stroke in Korean Dialysis Population: Another Health Threat Never to Be Underestimated

Stroke remains a significant health issue both globally and in Korea, as well. One nationally representative report recently showed that every year, approximately 105,000 people experience a new or recurrent stroke and more than 26,000 die of stroke in Korea (1). Stroke accounts for roughly 1 of every 10 deaths (1). Risk factors of stroke include old age, male, diabetes, hypertension, family history, and non-Caucasian ethnicity. Particularly, atherosclerotic risk factors such as smoking, hyperlipidemia and atrial fibrillation confer a greater risk of ischemic stroke, while alcohol use and bleeding diathesis predispose hemorrhagic stroke (2).

Chronic kidney disease (CKD) and end-stage renal disease (ESRD) substantially increases the risk of death, particularly due to cardiovascular disease (CVD) (3). Substantially increased incidence of CVD in CKD and ESRD patients could be attributed to the clustering of various risk factors mentioned above. Besides, nontraditional risk factors specific to uremic milieu, such as chronic inflammatory state, bleeding or pro-thrombotic tendency, use of anti-coagulation during hemodialysis (HD), accelerated vascular calcification, volume overload, hyperphosphatemia, and secondary hyperparathyroidism are additional contributing factors related with elevated risk of CVD.

Particularly, incidence rates of stroke among dialyzed patients range between 10 and 33 per 1,000 patient-years, which is about 10 times higher than the general population (4,5). Besides, the subtypes of stroke are also different. There is a higher proportion of hemorrhagic stroke among dialyzed patients, compared to the general population (6). However, most data in dialyzed patients are derived from HD patients in the US and Japan. Few reports are available on the incidence and prevalence of stroke among Korean dialysis patients— both HD and peritoneal dialysis (PD), particularly in the elderly dialysis population.

In this issue, Han et al. (7) reported the incidence of stroke in elderly population with either HD or PD from a nation-wide prospective cohort. They also investigated the factors associated with the development of stroke in elderly hemodialysis population from another large-scale prospective registry data. What is noticeable from their report is that the incidence rate for stroke — ischemic and hemorrhagic stroke combined — is twice higher than that of ischemic heart disease (117.8 vs. 60.6 per 1,000

patient-year) among Korean dialysis population. This could be in line with a recent pooled analysis of East Asians which showed that more people among general population die of stroke than ischemic heart disease (8). Another meta-analysis with subjects with estimated glomerular filtration rate (eGFR) < 60 mL/minute showed a higher stroke relative risk in Asian compared to non-Asian CKD population (9). An annual report from the Korean Society of Nephrology (KSN) ESRD Registry exhibited that the stroke accounted for 6.2% of total death among Korean ESRD population in 2016, more than 5.5%, which is accounted for by myocardial infarction (10). Therefore, clinicians need to pay attention to the stroke as a crucial cause of mortality in CKD population, particularly in Korea.

Finally, the study by Han et al. (7) is limited by insufficient assessment of the risk factors for stroke, such as smoking, alcohol use, atrial fibrillation, and bleeding tendency, since information on those common risk factors seemed unavailable. Besides, they did not distinguish between ischemic and hemorrhagic stroke. Last but not least, age- and sex-standardized incidence ratio of each stroke subtype, adjusted for the incidences among Korean general population is also warranted.

## DISCLOSURE

The authors have no potential conflicts of interest to disclose.

## ORCID

Kook-Hwan Oh <https://orcid.org/0000-0001-9525-2179>

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**Kook-Hwan Oh**

Department of Internal Medicine, Seoul National University College of Medicine, Seoul, Korea

Address for Correspondence:

**Kook-Hwan Oh, MD, PhD**

Department of Internal Medicine, Seoul National University College of Medicine, Seoul National University Hospital, 101 Daehak-ro, Jongno-gu, Seoul 03080, Korea  
E-mail: ohchris@hanmail.net

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