

Cholesterol Levels Are Associated with 30-day Mortality from Ischemic Stroke in Dialysis Patients

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Background: We investigated the impact of serum cholesterol levels on 30-day mortality after ischemic stroke in dialysis patients. *Methods:* From the Taiwan Stroke Registry data, we identified 46,770 ischemic stroke cases, including 1101 dialysis patients and 45,669 nondialysis patients from 2006 to 2013. *Results:* Overall, the 30-day mortality was 1.46-fold greater in the dialysis group than in the nondialysis group (1.75 versus 1.20 per 1000 person-days). The mortality rates were 1.64, .62, 2.82, and 2.23 per 1000 person-days in dialysis patients with serum

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total cholesterol levels of <120 mg/dL, 120-159 mg/dL, 160-199 mg/dL, and \geq 200 mg/dL, respectively. Compared to dialysis patients with serum total cholesterol levels of 120-159 mg/dL, the corresponding adjusted hazard ratios of mortality were 4.20 (95% confidence interval [CI] = 1.01-17.4), 8.06 (95% CI = 2.02-32.2), and 6.89 (95% CI = 1.59-29.8) for those with cholesterol levels of <120 mg/dL, 160-199 mg/dL, and \geq 200 mg/dL, respectively. **Conclusions:** Dialysis patients with serum total cholesterol levels of \geq 160 mg/dL or <120 mg/dL on admission are at an elevated hazard of 30-day mortality after ischemic stroke. **Key Words:** Cholesterol—dialysis—ischemic stroke, mortality—prognosis.

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Introduction

Stroke is one of the leading causes of death and long-term disability in patients with end-stage renal disease (ESRD).¹ The incidence of stroke is 5-10 times greater in the ESRD population than in the age-matched general population.^{2,5} Factors predisposing ESRD patients to stroke include traditional risk factors for atherosclerotic vascular disease, such as age, hypertension, diabetes, and dyslipidemia, and nontraditional risk factors associated with a uremic syndrome, such as anemia, abnormal mineral metabolism, inflammation, malnutrition, and oxidative stress.³

The risk of death after stroke in long-term dialysis patients is nearly 3 times greater than in the general population.⁶ Stroke survivors are also at an increased disability risk.⁴ Ischemic stroke is more common than hemorrhagic stroke in ESRD patients.^{4,5} Although the risk of ischemic stroke might increase with high serum cholesterol levels,^{7,8} hypercholesterolemia has been associated with lower mortality after ischemic stroke in the general population.⁹⁻¹² The impact of serum cholesterol levels on mortality after ischemic stroke in dialysis patients has not been well studied.

The Taiwan Stroke Registry (TSR) is a government-funded project that prospectively documented information on medical cares for acute stroke patients admitted at 54 major hospitals in Taiwan.¹³ The aim of this study was

to investigate the association between serum total cholesterol levels and 30-day mortality after ischemic stroke in ESRD patients undergoing dialysis using the TSR data.

Materials and Methods

Data Source

The TSR program was launched on August 1, 2006 and prospectively collected information on medical cares for stroke patients treated at 54 major hospitals in Taiwan, with the Institutional Review Board approval.¹³ To ensure the reliability of the data, neurologists and nurses at the participating hospitals responsible for completing the registration materials were trained with the TSR's standard operating procedure. This study used medical care records of 83,666 stroke patients who had been documented in the TSR database between 2006 and 2013. The registry program required each participating hospital to differentiate types of stroke using computed tomography or magnetic resonance imaging. All identifications of patients were scrambled to protect privacy.

Study Subjects

Figure 1 details the procedure of identifying subjects for the present study. After excluding patients with hemorrhagic stroke and other types of stroke, we identified

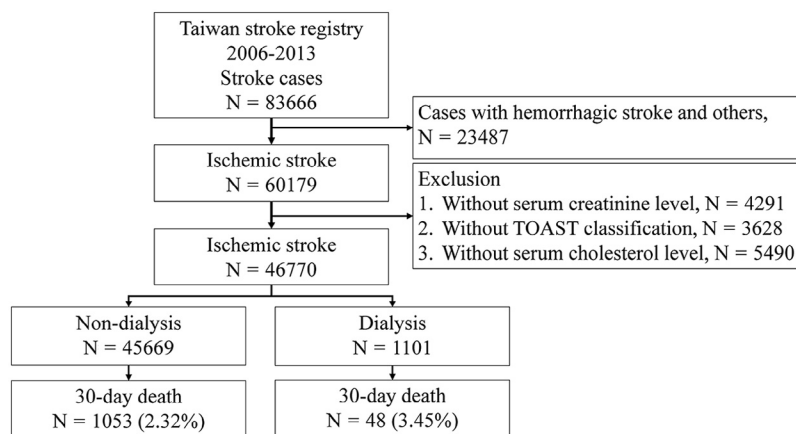


Figure 1. Flow chart for study subjects.

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