

## Effect of Cognitive Reserve on Cognitive Impairment and Recovery after Stroke: The KOSCO Study

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### Purpose

The theory of cognitive reserve (CR) was introduced to account for individual differences in clinical manifestation of neuropathology. This study was conducted to investigate whether CR had moderating effect on cognitive impairment and recovery after stroke.

### Methods

This study was an interim analysis of the Korean Stroke Cohort for Functioning and Rehabilitation (KOSCO) designed as 10 years long-term follow-up study of stroke patients. All patients who admitted to the representative hospitals in 9 distinct areas of Korea with their acute first-ever stroke (from August 2012 to May 2015) were recruited. In this study, a total of 7,166 patients with cognitive test score at least at one time point until 30 months after onset were included. Educational level and premorbid occupation were used as proxies of CR. performance on Korean Version of Mini-Mental State Examination (K-MMSE) was analyzed with ANCOVA, logistic regression and multi-level model.

### Results

The rate of cognitive impairment (<16%ile), classified according to an age and education adjusted norm, was higher in patients with low levels of education (except patients with no education) or occupation than patients with high levels of education or occupation at every time points (7 days after stroke, transfer to rehabilitation, discharge, and 3 months, 6 months, 12 months, 18 months, 24 months, and 30 months after stroke). As a result of ANCOVA, cognitive impairment was more severe in patients with low levels of education (except patients with no education) or occupation than in patients with high education or occupation at every time points when adjusted for demographic and stroke-related risk factors ( $p < 0.05$ ). Predictive effect of CR composite score was significant in logistic regression ( $p < 0.05$ ): low CR increased risk of cognitive impairment at every time points. In multi-level model analysis, K-MMSE total score was improved within the first 6 months and reached plateau, but the slope of the increase over the first 6 months was steeper in patients with high CR than low CR ( $p < 0.05$ ).

**Conclusion**

These results supported the moderating role of CR on cognitive impairment and recovery after stroke. High CR reduced the risk of cognitive impairment after stroke and increased the speed of cognitive recovery during 6 months after stroke.

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