

뇌신경재활

발표일시 및 장소 : 10 월 27 일(토) 10:50-11:00 Room C(5F)

OP2-3-6

Intensive Inpatient Rehabilitation Affects Functional Outcomes at 3 Months after Ischemic Stroke

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Objective

Although it is highly recommended in most of stroke guidelines, early rehabilitation has limited evidence to guide practice. The aim of this study was to investigate the effect of intensive inpatient rehabilitation on functional outcome at 3 months in first-ever ischemic stroke patients.

Materials and 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, we analyzed data of 3,912 ischemic stroke patients who completed the 3 months follow-up. NIHSS at day 7 was used as stroke severity at acute phase. Multi-facet assessments at day 7 after onset included Korean Mini-Mental State Examination, Fugl-

Meyer Assessment, Functional Ambulatory Category, the American Speech-Language-Hearing Association National Outcome Measurement System Swallowing Scale, Short Korean Version of Frenchay Aphasia Screening Test. In addition, the course of the stroke during the hospitalization was reported, including information on neurologic aggravation, four common complications during hospitalization, and hospitalization duration. We assessed whether stroke patient received the intensive inpatient rehabilitation during the hospitalization defined as stroke patients who transferred to the rehabilitation department after acute stroke care. The univariate and the multivariate linear regression analyses with factors at 7 days and the course of the stroke during the hospitalization were performed to determine the significant relating factors of the Korean modified Barthel Index (K-MBI) at 3 months.

Results

Table 1 presents the demographic and clinical characteristics of patients. Table 2 shows Results of univariate regression analysis with factors at 7 days and the course of the stroke during the hospitalization for K-MBI at 3 months. The multivariate linear regression analysis with factors at 7 days and the course of the stroke during the hospitalization for K-MBI at 3 months was showed in Table 3. The multivariate regression analysis showed that the intensive inpatient rehabilitation was one of positive relating factors of K-MBI at 3 months in ischemic stroke patients ($p < 0.05$).

Conclusion

These Results demonstrate the significant effects of subacute intensive rehabilitation to improve functional outcome at 3 months in the first-ever ischemic stroke patients. Intensive rehabilitation should be provided to all stroke patients with functional impairment after acute stroke management.

Table 1. Distribution of general and clinical patient characteristics^a

| Variables | Ischemic stroke patients (n=3,912) |
|---|------------------------------------|
| | Mean±SD (range) or percentage |
| Age, years | 64.8±12.3 (20-98) |
| Sex, male | 61.8% |
| Body mass index | 23.9±3.3 (14-44) |
| Smoking, current | 28.4% |
| Alcohol, current | 39.8% |
| Education, years | 9.7±4.8 (0-21) |
| Medical history | |
| Hypertension, Yes | 56.0% |
| Diabetes mellitus, Yes | 24.2% |
| Coronary heart disease, Yes | 6.7% |
| Atrial fibrillation, Yes | 8.7% |
| Hyperlipidemia, Yes | 11.2% |
| CCAS | 5.2±1.7 (2-21) |
| Premorbid mRS, score | 0.6±1.2 (0-5) |
| NIHSS at 7 day | 3.3±5.1 (0-42) |
| Functional assessments at 7 day | |
| Fugl-Meyer Assessment | 82.5±29.2 (0-100) |
| K-MMSE | 23.2±7.5 (0-30) |
| Functional Ambulatory Category | 3.2±1.8 (0-5) |
| AHS-A-NOMS | 6.2±1.7 (1-7) |
| Short K-FAST | 14.3±5.5 (0-20) |
| Neurological aggravation, Yes | 4.0% |
| Complication during hospitalization | |
| Thromboembolic disease, Yes | 1.4% |
| Pneumonia, Yes | 1.7% |
| Ventilatory insufficiency, Yes | 0.4% |
| Urinary tract infection, Yes | 1.8% |
| Duration of hospitalization, days | 14.5±20.0 (1-328) |
| Intensive inpatient rehabilitation, Yes | 17.8% |

CCAS, combined condition- and age-related score; NIHSS, National Institutes of Health Stroke Scale; mRS, modified Rankin scale; K-MMSE, Korean Mini-Mental State Examination; AHS-A-NOMS, the American Speech-Language-Hearing Association National Outcome Measurement System Swallowing Scale; Short K-FAST, Short Korean Version of the Frenchay Aphasia Screening Test.

Table 2. Univariate regression analysis for functional outcome at 3 months in ischemic stroke patients.

| | K-MBI at 3 months |
|-------------------------------------|-------------------|
| | β (P-value) |
| Age (yr) | -0.271(<0.001)* |
| Sex, male | 0.129(<0.001)* |
| Body mass index | 0.066(<0.001)* |
| Smoking, current | 0.069(<0.001)* |
| Alcohol, current | 0.141(<0.001)* |
| Education years | 0.192(<0.001)* |
| Medical history | |
| Hypertension | -0.062(0.001)* |
| Diabetes mellitus | -0.055(0.002)* |
| Coronary heart disease | -0.043(0.013)* |
| Atrial fibrillation | -0.076(<0.001)* |
| Hyperlipidemia | 0.001(0.476) |
| CCAS | -0.061(0.001)* |
| Premorbid mRS | -0.133(<0.001)* |
| NIHSS at day 7 | -0.679(<0.001)* |
| Functional levels at day 7 | |
| FMA | 0.637(<0.001)* |
| K-MMSE | 0.496(<0.001)* |
| FAC | 0.553(<0.001)* |
| AHSA-NOMS | 0.441(<0.001)* |
| Short K-FAST | 0.443(<0.001)* |
| Neurological aggravation | -0.090(<0.001)* |
| Complication during hospitalization | |
| Thromboembolic disease | -0.014(0.230) |
| Pneumonia | -0.164(<0.001)* |
| Ventilatory insufficiency | -0.033(0.045) |
| Urinary tract infection | -0.216(<0.001)* |
| Duration of hospitalization | -0.376(<0.001)* |
| Intensive inpatient rehabilitation | -0.277(<0.001)* |

*p<0.05.

K-MBI, Korean modified Barthel Index; K-MMSE, Korean Mini-Mental State Examination; FMA, Fugl-Meyer Assessment; FAC, Functional Ambulatory Category; AHSA-NOMS, the American Speech-Language-Hearing Association National Outcome Measurement System Swallowing Scale; Short K-FAST, Short Korean Version of the Frenchay Aphasia Screening Test; CCAS, combined condition- and age-related score; mRS, modified Rankin scale; NIHSS, National Institutes of Health Stroke Scale.

Table 3. Multiple linear regression analysis for functional outcome at 3 months in ischemic stroke patients.

| | K-MBI at 3 months |
|-------------------------------------|-------------------|
| | β (P-value) |
| Age (yr) | -0.268 (<0.001)* |
| Sex, male | - |
| Body mass index | - |
| Smoking, current | - |
| Alcohol, current | 1.308 (0.014)* |
| Education years | - |
| Medical history | - |
| Hypertension | - |
| Diabetes mellitus | - |
| Coronary heart disease | - |
| Atrial fibrillation | - |
| Hyperlipidemia | - |
| CCAS | 0.761 (<0.001)* |
| Premorbid mRS | - |
| NIHSS at day 7 | -1.706 (<0.001)* |
| Functional levels at day 7 | - |
| FMA | 0.173 (<0.001)* |
| K-MMSE | 0.273 (<0.001)* |
| FAC | 1.120 (<0.001)* |
| AHSA-NOMS | - |
| Short K-FAST | - |
| Neurological aggravation | - |
| Complication during hospitalization | - |
| Thromboembolic disease | - |
| Pneumonia | -7.226 (0.002)* |
| Ventilatory insufficiency | - |
| Urinary tract infection | -8.860 (<0.001)* |
| Duration of hospitalization | -0.127 (<0.001)* |
| Intensive inpatient rehabilitation | 5.357 (<0.001)* |

*p<0.05.

K-MBI, Korean modified Barthel Index; K-MMSE, Korean Mini-Mental State Examination; FMA, Fugl-Meyer Assessment; FAC, Functional Ambulatory Category; AHSA-NOMS, the American Speech-Language-Hearing Association National Outcome Measurement System Swallowing Scale; Short K-FAST, Short Korean Version of the Frenchay Aphasia Screening Test; CCAS, combined condition- and age-related score; mRS, modified Rankin scale; NIHSS, National Institutes of Health Stroke Scale.⁴¹