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Special Review

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Changes in Epidemiological Trends and Rehabilitation Usage in Neurological Diseases in Korea: Stroke

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HIGHLIGHT

- Rehabilitation assessments have been performed faster in more stroke patients.
- Intensive rehabilitation has been applied at an earlier stroke phase.
- More basic statistical research based on accurate national statistics is needed.

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Conflict of Interest
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ABSTRACT

Stroke survivors with disabilities have increased in Korea as the population has aged. Early stroke rehabilitation is known to be an essential therapy in gaining functional independence and preventing complications. Recent research on the rehabilitation usage of stroke patients was reviewed in this manuscript. For the past 15 years, it was found that comprehensive rehabilitation assessments have been performed faster in more stroke patients, and intensive inpatient stroke rehabilitation has been applied to more stroke patients at an earlier stroke phase in Korea. In addition, the effect of rehabilitation was maintained. However, few reports have assessed the status of stroke rehabilitation in Korea. Therefore, basic statistical research based on accurate national statistics is needed in the future.

Keywords: Stroke; Rehabilitation; Epidemiology; Cohort Studies

INTRODUCTION

Stroke is a serious and disabling healthcare problem across the world [1]. The incidence of stroke has gradually increased in Korea with the aging of the population [2]. The mortality rate of stroke has, fortunately, declined with time due to improvements in medical management [2]. These results mean that the number of stroke survivors has increased in Korea, and many stroke survivors live with certain disabilities. An important aspect of care to reduce dependency depends upon rehabilitation treatments after the hyperacute stroke phase.

It is well known that intensive inpatient rehabilitation treatment during the subacute stage can reduce disabilities in stroke patients [1,3]. Clinical practice guidelines (CPGs) for stroke rehabilitation have been developed to enhance the quality of care and increase the consistency of practices across settings in many countries [4-6]. In Korea, CPGs for stroke rehabilitation were formulated through both an extensive review of published literature and a consensus meeting of specialists in 2009 and have been updated periodically [7-9].

The CPGs for stroke rehabilitation in Korea recommend that early rehabilitation for hospitalized stroke patients is provided in environments with organized and interprofessional stroke care and that stroke survivors receive sufficient rehabilitation as soon as possible at an intensity commensurate with the anticipated benefit and tolerance

[7]. However, there is a lack of reports on the extent of adequate stroke rehabilitation in clinical practice. Therefore, in this manuscript, research on the rehabilitation usage of stroke patients in Korea was reviewed.

STATUS OF STROKE REHABILITATION DURING THE FIRST ADMISSION

According to a study on patients with first-ever acute strokes who were admitted to three tertiary hospitals in Korea during the two-year period between 2008 and 2009, rehabilitation consultation was undertaken for 27.9%, and 22.9% of the stroke patients received rehabilitation therapy. The mean interval between admission and the rehabilitation consultation was 14.5 ± 46.9 days. In addition, 12.9% of the stroke patients were transferred to the rehabilitation department for comprehensive stroke rehabilitation. The mean interval between admission and rehabilitation transfer was 23.4 ± 36.8 days [10]. The Korean Brain Rehabilitation Database (KBRD) V1.0 from 2007 to 2011 reported that the mean interval between onset and rehabilitation transfer gradually decreased from 44 to 30 days [11]. According to the Korean Stroke Cohort for functioning and rehabilitation (KOSCO) with 10,686 first-ever acute stroke patients who were admitted to 9 tertiary hospitals in Korea between 2012 and 2015 [12], rehabilitation consultation was undertaken in 75.3%, and 65.5% of the stroke patients received rehabilitation therapy. The mean interval between admission and rehabilitation consultation was 2.6 ± 7.4 days. In addition, 16.5% of the stroke patients were transferred to the rehabilitation department for comprehensive stroke rehabilitation. The mean interval between admission and rehabilitation transfer was 16.5 ± 22.3 days after the admission of each hospital [13].

From 2007 to 2015, stroke rehabilitation in Korea was developed, in which more patients were assessed by a physiatrist and adequate rehabilitation in a shorter time. However, there was a very large variation in stroke rehabilitation process among nine tertiary hospitals in Korea. **Fig. 1** shows the rate and the mean interval of rehabilitation consultations from

Fig. 1. Status of stroke patients who received consultations in the department of rehabilitation medicine [13]. A-I, Each hospital participating in the Korean Stroke Cohort for functioning and rehabilitation.

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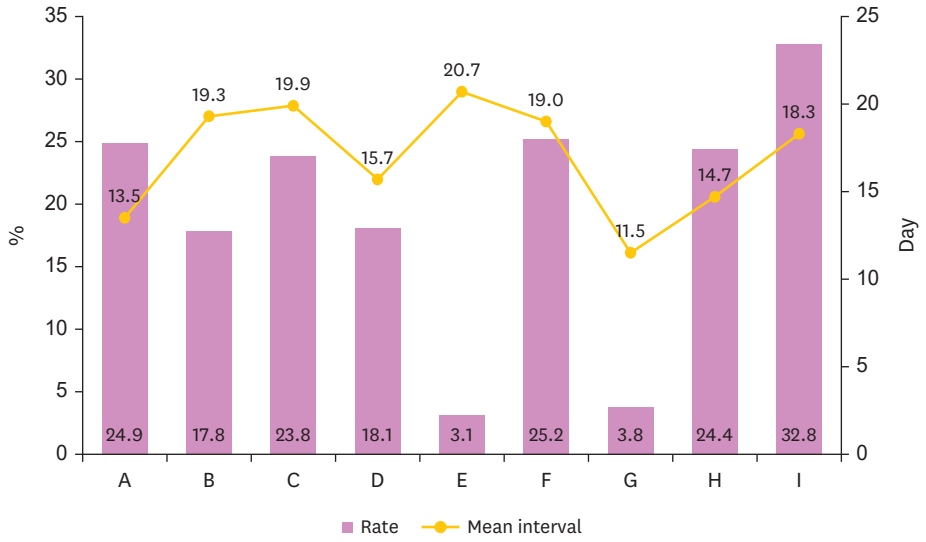

Fig. 2. Status of stroke patients who were transferred to the department of rehabilitation medicine [13]. A-I, Each hospital participating in the Korean Stroke Cohort for functioning and rehabilitation.

KOSCO [13]. In one hospital, 97.3% of the stroke patients at a mean of 1.0 day after the admission to each hospital had a consult with the rehabilitation department. In contrast, 58.2% of the stroke patients at a mean of 6.3 days had a consult with the rehabilitation department in other hospitals. There was also a very large variation in transfers to the department of rehabilitation medicine among nine tertiary hospitals. **Fig. 2** shows this variation. In some hospitals, more than 20.0% of the stroke patients were transferred to the department of rehabilitation medicine. However, less than 5.0% of the stroke patients were transferred to the department of rehabilitation medicine in the other 2 hospitals.

STATUS OF LENGTH OF STAY OF INTENSIVE INPATIENT STROKE REHABILITATION PATIENTS

KBRD V1.0 from 2007 to 2011 showed that the mean length of stay (LOS) in the department of rehabilitation medicine decreased from 45 to 28 days [11]. According to a study on patients with first-ever acute stroke who were admitted to 3 tertiary hospitals in Korea during the 2-year period between 2008 and 2009, the mean LOS in the department of rehabilitation medicine was 24.8 ± 20.3 days [10]. Between 2012 and 2015, the mean LOS in the department of rehabilitation medicine was 32.8 ± 26.4 according to the KOSCO report [13].

STATUS OF DISCHARGE DESTINATION AFTER INTENSIVE INPATIENT STROKE REHABILITATION

According to a study on patients with first-ever acute stroke who were admitted to three tertiary hospitals in Korea during the 2-year period between 2008 and 2009, 31.9% of the stroke patients were discharged to their homes, and 47.7% were discharged to another hospital to continue inpatient rehabilitation treatment after intensive inpatient stroke rehabilitation [10]. In contrast, 41.9% of the patients were discharged to their homes and 44.8% were discharged to another hospital to continue inpatient rehabilitation treatment

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according to the KOSCO report [13]. These results meant that more stroke patients tended to be discharged to their homes from 2008 to 2015.

FUNCTIONAL IMPROVEMENT AFTER INTENSIVE INPATIENT STROKE REHABILITATION

KBRD V1.0 from 2007 to 2011 demonstrated that functional efficiency increased while the K-MBI gain was relatively constant [11]. These results meant that effective intensive inpatient stroke rehabilitation treatment was achieved even if the LOS was reduced.

CONCLUSION

For the past 15 years in Korea, comprehensive rehabilitation assessments have been performed faster in more stroke patients, and intensive inpatient stroke rehabilitation has been applied to more stroke patients at an earlier stroke phase. In addition, although the period of hospitalization in rehabilitation medicine has gradually decreased, the effect of rehabilitation was maintained. With the quantitative and qualitative development of stroke rehabilitation in Korea, it is expected that better quality stroke rehabilitation will be achieved in the future.

In spite of the quantitative and qualitative development of stroke rehabilitation in Korea, it was also confirmed that basic statistical data of stroke rehabilitation were very insufficient. The small number of reports included mostly research data from tertiary hospitals, and there were no data on stroke rehabilitation in primary and secondary hospitals. Because it is known that stroke rehabilitation in tertiary hospitals is more actively conducted than in primary and secondary hospitals [14], if statistical data in the primary and secondary hospitals are included, the quality and quantity of stroke rehabilitation would be slightly lower than the data described in this manuscript. In addition, statistical data on stroke rehabilitation in the chronic phase after the subacute phase were very scarce. Statistical information on rehabilitation treatment after the subacute phase, rehabilitation treatment at the affiliated hospital after the initial discharge, and the effects thereof should be added. Therefore, basic statistical research based on accurate national statistics is needed in the future.

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