The relationship between communication activities of daily living and quality of life among the elderly suffering from stroke

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Abstract. [Purpose] Disabilities after stroke are known to have adverse effects on the quality of life. This study investigated the relationship between Communication Activities of Daily Living (C-ADL) and quality of life of elderly stroke patients to provide basic data for use in enhancing the quality of life. [Subjects and Methods] One hundred sixty five elderly over the age of 60, who were diagnosed as having stroke and receiving treatment in rehabilitation departments of general hospitals were surveyed. Stroke patients’ basic communication ability to survive in daily living was measured using the C-ADL Second Edition, and stroke patients’ quality of life was measured with the Stroke-Specific Quality of Life (SSQOL). The relationship between C-ADL and SSQOL was analyzed using multiple regression analysis. [Results] C-ADL had a significant positive relationship with SSQOL. [Conclusion] This result implies that it is necessary to enhance stroke patients’ communication ability in daily living in order to raise their quality of life.

Key words: Stroke-Specific Quality of Life, Communication Activities of Daily Living, Stroke

INTRODUCTION

In line with the worldwide aging trend, Korea became an aging society in 2000 and is expected to become an aged society with an elderly population over the age of 65 of 14% of total population1). In addition, the average life span of Koreans was 79.6 years in 2010, 15 years longer than that of 19801). Despite increases in social demands by the elderly for high-quality and satisfactory life, with the increase in the elderly population and their extended average life span, there is a high possibility that the elderly will lives accompanied by more diseases because of the degree of prolongation of their life span2). Especially, cerebrovascular diseases are known as typical geriatric diseases that threaten the health of the elderly. According to a survey by the Korea Center for Disease Control and Prevention, 7.2% of the elderly population over the age of 65 had experience of stroke in 2013, which is an 5.3% increase from 20013).

Stroke is a generic term for both cerebral infarction caused by the blockage of a blood vessel in the brain, and cerebral hemorrhage caused by the rupture of a blood vessel in the brain. Stroke is not only the most common of disease, but it also has enormous social costs, such as medical costs. Medicine costs, loss of productivity, and the socio-economic cost of stroke in Korea were estimated to amount to US 3.5 billion as of 20104).

Although stroke occurs in all age groups, the elderly are the most susceptible group, since its prevalence rate increases rapidly with every 10 years of age5). Twenty-five percent of the stroke patients die within 1 month of stroke onset, and even after survival, it has been reported that 60% of the surviving patients suffer from various disabilities such as paralysis, motor disorder, cognitive impairment and speech disorders, which leave them unable to lead independent daily lives without the help of others. Moreover, 70% of survivors suffer from communication disorders such as dysarthria and aphasia6), and among

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the disabilities resulting from stroke, communication problems frequently occur. According to the American Heart Association and American Stroke Association, among 2 million stroke survivors in 2005, approximately 1 million had aphasia. Disabilities after stroke are known to have adverse effects on the quality of life, and among them, communication disorders place burdens not only on patients but on their families as well. As the majority of stroke patients have to lead their lives with disabilities, the quality of life including psychological and social aspects should be given consideration.

Especially, Communication Activities of Daily Living (C-ADL) is important, because it examines the basic communication ability necessary for survival in daily living such as social interactions and non-verbal communication. Similarly, although communication is an important factor in terms of quality of life, studies on communication of stroke patients remain limited to the understanding of the linguistic abilities of stroke patients, and there is a lack of studies on the theme of communication. While studies of stroke patients’ Activities of Daily Living (ADL) have been regularly conducted, studies of C-ADL are very rare.

This study investigated the relationship between C-ADL and the quality of elderly stroke patients’ lives to provide basic data for use in enhancing the quality of life.

SUBJECTS AND METHODS

The present study conducted convenience sampling 4 times from August through December 2014, and surveyed 165 elderly over the age of 60, who were diagnosed as having stroke and receiving treatment in rehabilitation departments of general hospitals located in Seoul, Incheon, Daejeon and Gwangju. One hundred fifty-eight fully completed questionnaires were analyzed; 7 questionnaires had incomplete answers. As the required minimum number of samples was 88 patients to obtain a significance level of α=0.05, and an effect size of 0.5, with a statistical power of (1-β)=0.95 according to the G-power 3.0 program, the number of subjects in this study was more than sufficient. The subjects were given sufficient explanation regarding the purpose and experimental method of this study before participation and gave their voluntary consent. The study protocol was approved by the Institutional Review Board of N University and was conducted in accordance with the ethical principles of the Declaration of Helsinki. Together with the questionnaire on Communication Activities of Daily Living, a survey of quality of life was conducted via individual interviews.

The inclusion criteria for subjects were: literate patients with consciousness, within 1 year after the onset of stroke, who had no accompanying neurological diseases such as dementia or Parkinson’s disease, or apraxia or agnosia. Stroke patients’ basic communication ability to survive in daily living was measured with the Communication Activities of Daily Living-Second Edition (C-ADL-2). C-ADL-2 is composed of a total of 50 questions with responses scored on a 3-point scale (0 point: wrong answer, 1 point: proper answer, 2 points: correct answer) and higher scores indicate higher communication ability in daily living. Test questions are classified into following 7 categories: (1) reading, writing or using numbers, (2) social interactions, (3) divergent communication, (4) contextual communication, (5) nonverbal communication, (6) sequential relationships, and (7) humor, metaphor, absurdity. Among them, divergent communication includes deciding lunch time and choosing menus, and contextual communication contains interpretation of danger signs while sequential relationships includes understanding of speed limits and buying things in a supermarket. The reliability of the test was Cronbach’s α=0.93.

Stroke patients’ quality of life was assessed using the stroke-specific quality of life (SSQOL) developed by Williams et al. SSQOL is an index of stroke patients’ characteristics and comprises 49 questions in 12 areas including movement abilities (6 questions), functions of upper extremity (5 questions), linguistic function (5 questions), thinking abilities (3 questions), visual functions (3 questions), self-care (5 questions), emotional state (5 questions), personality (3 questions), physical stamina (3 questions), role in the family (3 questions), social role (5 questions) and productive capability (3 questions). Each response is scored on a 5-point scale and higher scores indicate higher levels of quality of life. The reliability of the test was Cronbach’s α=0.87.

Covariate variables were age, sex, final education (middle school and lower, high school or above), the average monthly income of households (less than 2 million won, 2–4 million won, more than 4 million won), marital status (living with spouse, living without spouse, unmarried person), drinking (non-drinker, former drinker, current drinker), smoking (non-smoker, past smoker, current smoker), stroke type (cerebral hemorrhage, cerebral infarction), time since onset of stroke (less than 3 months, 3–6 months, 6–12 months), depressive symptoms in the last 1 months (yes, no).

Data was analyzed using SPSS 22.0. First, for subjects’ general characteristics, means and percentages were calculated and are presented as descriptive statistics. Second, in order to examine the differences in SSQOL based on subjects’ C-ADL characteristics, the independent t-test and one-way ANOVA were performed. Finally, the relationship between C-ADL and SSQOL was analyzed using multiple regression analysis.

RESULTS

The average age of the subjects was 67.5 (standard deviation 6.8 years); 53.8% of the subjects were males, 88.5% were married, 63.6% were middle school graduates or above, 67.0% had cerebral infarction, 61.9% had a monthly household income of less than 2 million won, 26.5% were, past smokers, 38.5% were past drinkers, 68.0% had experience of depression.
symptoms in the last 1 month, and the majority of the subjects were 6–12 months since the onset of stroke. Subjects’ mean C-ADL was 62.3 points (standard deviation 16.5) and mean SSQOL was 149.9 points (standard deviation 35.7).

In the multiple regression analysis, the $R^2$ of the final model was 0.23 and the explanatory power of the model was 23% with the variance inflation factors (VIF) being all less than 10, proving that there was no problem with multi-collinearity among the independent variables. In the bivariate analysis, a significant positive relationship was found for C-ADL with SSQOL ($B=0.54$, $t=13.28$, $p<0.05$). In model 1, after adjusting for age, sex, final education, the average monthly income of households, marital status, drinking and smoking, the relationship of C-ADL with SSQOL was maintained ($B=0.48$, $t=3.32$, $p<0.05$). In model 2, after adjusting for all the compounding variables, C-ADL had a significant positive relationship with SSQOL ($B=0.46$, $t=3.11$, $p<0.05$).

**DISCUSSION**

Although communication problems frequently occur due to the after-effects of stroke, there is a lack of studies of stroke patients’ communication abilities in daily life. The present study investigated the relationship between elderly stroke patients’ C-ADL and quality of life, and found that C-ADL had a significant positive relationship with quality of life.

Numerous studies have reported a relationship between ADL and quality of life. According to these studies, stroke patients’ ADL is a significant variable predicting stroke patients’ quality of life$^{13}$, and the higher the functions of ADL, the higher the quality of life$^{14}$). These results are similar to the results of the present study that higher stroke patients’ ADL indicates higher quality of life.

As disabilities from stroke become chronic, inability to independently perform ADL, such as putting on clothes and eating for an extended period of time, not only causes helplessness and depression in stroke patients$^{14}$, but also inflicts emotional pain, such as intellectual regression, despair and anxiety$^{10}$. That is, functional disorders in daily life cause stroke patients to experience psychological pain and loss of social functions, and if these problems are prolonged, they are likely to cause deterioration in their quality of life and maladjustment in social relationships, changes in role and economic difficulties.

Although it is difficult to directly compare the results of preceding studies$^{10,13,14}$ with those of the present study, communication is likely to have a significant effect on quality of life, considering that it is an ability necessary for instrumental daily life. Especially, stroke patients experience deterioration of social functions due to limitation of communication, and when they have difficulty in understanding the meaning of what another party says, or in producing speech, even when they have clear consciousness, it is highly possible that they feel extreme frustration and depression$^{15}$.

Nevertheless, therapeutic rehabilitation for stroke mainly focuses on physical rehabilitation, while linguistic, emotional and social rehabilitation tends to be ignored. As communication problems are likely to lower the quality of life by leading stroke patients to give up their will to live$^{16}$, in order to enhance stroke patients’ quality of life, it is necessary to consistently improve communication functions from the early stage after onset of stroke, and to extend support to reduce stroke patients’ difficulties in leading their daily lives.

A limitation of this study was the exclusion of patients with severe aphasia, for whom test could not be conducted, therefore, caution should be taken in generalizing the results of this study. Also, since this study was a cross-sectional study, the results cannot be interpreted in causal relationships. Longitudinal studies will be required to verify causal relationships.

A significant positive relationship with SSQOL was found for C-ADL in this study. This result implies that it is necessary to enhance stroke patients’ communication ability in daily living in order to raise their quality of life.

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