The Role of Speech-Language Pathologists in Stroke Rehabilitation

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INTRODUCTION

According to the American Heart Association's *2015 Heart Disease and Stroke Statistics Update,* stroke is the fourth leading cause of death in the United States (129,000 people per year) as well as a major cause of long term disability.[1] In addition to the physical impairments caused by stroke, many individuals may experience changes in their cognitive, communication, and swallowing abilities. A speech-language pathologist (SLP) is trained to evaluate and treat these types of disorders and is an integral part of the rehabilitation team in an acute inpatient rehabilitation facility (IRF). This article will provide a brief overview of these disorders and a description of the SLP's role in stroke rehabilitation.

COGNITION

"Cognition" refers to an individual's thinking skills, and includes the ability to concentrate on one or more tasks simultaneously, to recognize frequently encountered people and remember daily routines, to make decisions and solve problems, and to organize and carry out a sequence of steps to complete a task. Impairments in one or more of these areas can impact an individual's ability to safely and effectively perform activities of daily living.[2] A data collection study of the South London Stroke Register between the years of 1995 and 2010 suggested that the prevalence of cognitive impairment following stroke was around 22% at three months post-stroke and at annual follow up.[3] It should be noted that for the purposes of this study, patients with severe aphasia, dysarthria, deafness, or visual impairment were excluded because they could not undergo formal cognitive testing; therefore, this figure may be a significant underrepresentation of the true prevalence of cognitive impairment secondary to stroke. Following a patient's admission to an IRF, the speech-language pathologist conducts an evaluation to identify the cognitive domains most severely affected by the stroke. This evaluation includes both informal testing and formal assessment measures such as the Cognitive Linguistic Quick Test (CLQT), the Assessment of Language-Related Functional Activities (ALFA), and the Brief Cognitive Assessment Tool (BCAT). The CLQT has tests such as clock drawing, generative naming of animals, and remembering details of a short narrative. In the ALFA, tests include simple math, understanding medicine labels, and transcribing phone messages. Based on the patient's performance, the SLP then develops an individualized treatment plan, which may involve exercises to improve attention, memory, problem solving, executive functioning, and visuospatial skills. Treatment examples include using a memory log to improve recall of daily events; training in the use of environmental aids to assist with orientation; and using spaced retrieval training to improve the acquisition, retention and generalization of trained information and/or skills. In this particular method, individuals are trained to recall a specific target over gradually increasing time intervals. The SLP may also work in conjunction with the occupational or physical therapist to address the targeted cognitive skills in a functional context, such as preparing a meal or purchasing an item from the gift shop. These tasks are highly functional and require many cognitive skills including planning, organization, sequencing, divided attention, self-monitoring, problem solving, and memory.

APHASIA

A stroke on the left side of the brain often results in aphasia. This impairment in language may affect an individual's ability to speak, understand, read or write. Aphasia is present in 21%–38% of acute stroke patients.[4] It is estimated that in the United States there are 80,000 new cases of aphasia each year and a total of one million people suffer from aphasia.[5] Research has suggested that greater frequency and intensity of aphasia treatment leads to better recovery of language.[6] Clinical practice guidelines suggest that individuals with stroke-induced aphasia should receive SLP treatment between two to eight hours a week, and treatment initiated early in the recovery process is more effective than when initiated later.[7] Therefore, patients with stroke-induced aphasia may benefit from the more intense therapy schedule at an IRF, where individuals with aphasia receive a minimum of five hours of speech therapy per week. Depending on the type of aphasia, treatment may focus on word retrieval exercises, sentence formulation, following auditory or written directions, or training with alternative and augmentative communication aids. In some cases, patients with expressive aphasia may benefit from script training, which involves the rehearsal of specific responses to facilitate communication of basic wants and needs.

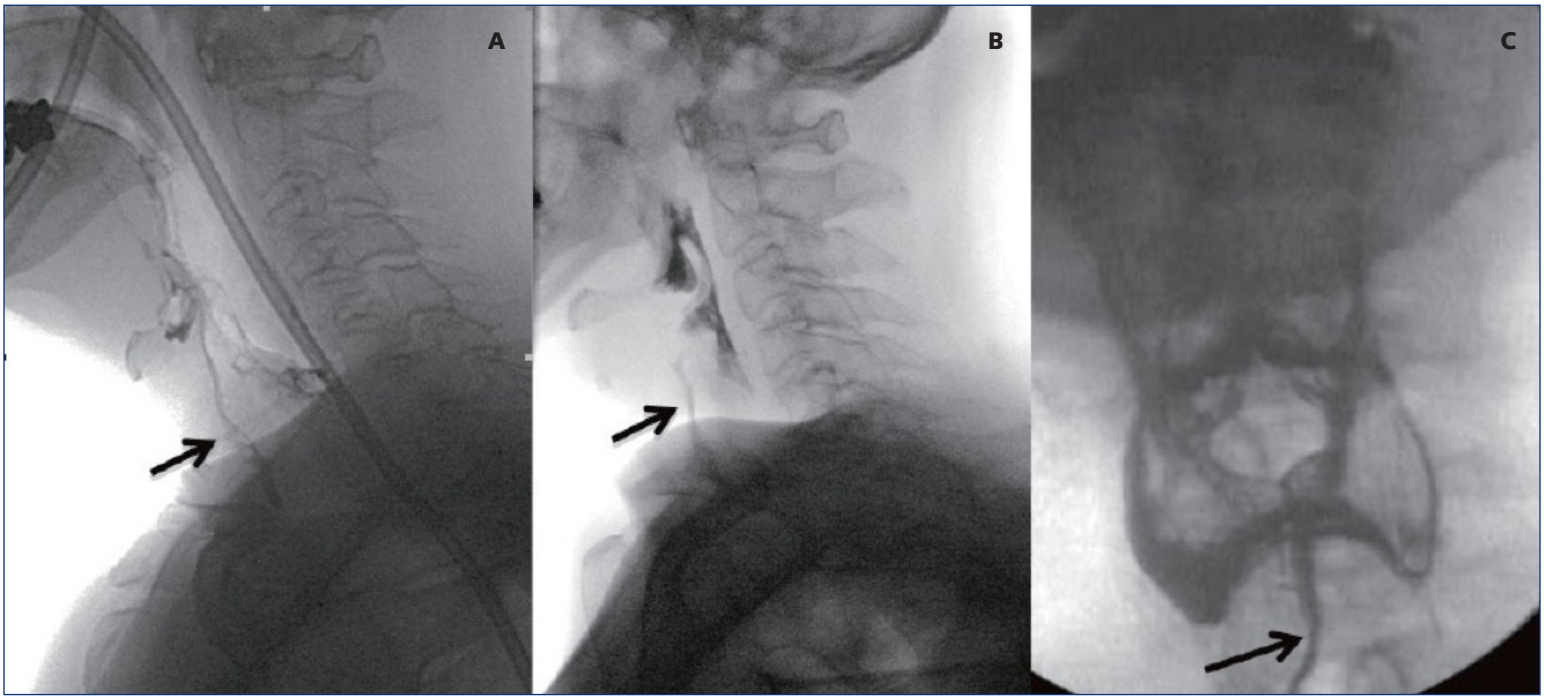
DYSPHAGIA

SLPs in the inpatient rehabilitation setting also evaluate and treat dysphagia. A person with dysphagia may have difficulty with the oral, pharyngeal, or esophageal phases of swallowing, and this can occur with liquids, solids or both. A 2009 study conducted by Falsetti et al. found that dysphagia occurred in more than one-third of consecutive patients admitted to a neurorehabilitation hospital following stroke; however, other studies have found a wide incidence, between 29% and 81%. Between 22% and 52% of individuals with dysphagia experience aspiration of material into the airway, and nearly half of aspirations in patients with stroke are silent. The presence of dysphagia has been linked to malnutrition, dehydration, pulmonary infections, prolonged hospital stays, and death.[8] When a patient is suspected of having dysphagia, an SLP will conduct a clinical bedside assessment, but in some cases, that is not sufficient, especially if aspiration is silent. One of the greatest benefits of an IRF in a hospital setting is the on-site availability of a videofluoroscopic swallow study (VFSS). The VFSS is considered the "gold standard" of swallowing assessments and allows the SLP to objectively assess the patient's swallowing function and to establish the safest and least restrictive diet textures (**Figure 1**). This minimizes the patient's risk of aspiration and the associated complications. The VFSS is conducted in conjunction with a radiologist and allows the SLP to assess the oral, pharyngeal, and upper esophageal phases of the swallow mechanism with a variety of liquid and solid textures, along with compensatory strategies that may improve the patient's swallowing safety. For example, a patient with a delayed swallow trigger or reduced epiglottic deflection may benefit from the use of a "chin tuck" or "chin-down" posture while swallowing. This strategy widens the valleculae and places the epiglottis in closer proximity to the posterior pharyngeal wall. In some cases, the implementation of this strategy enables the patient to safely swallow thin liquids, avoiding the need to restrict the diet with thickened liquids. The VFSS allows direct visualization of how patients respond to food and liquids of various textures and to compensatory strategies. In contrast, empirical trials could lead to silent aspiration and to pneumonia. Once the cause of the dysphagia is established, the SLP develops a treatment plan which may consist of strengthening exercises for the oral, laryngeal, and pharyngeal musculature as well as compensatory strategy training.

CONCLUSION

After a stroke, patients often experience impairments of their cognitive, communication, and swallowing functions, which worsens their disabilities and quality of life. In acute inpatient rehabilitation facilities, speech-language pathologists offer advanced clinical techniques for the evaluation and treatment of these conditions as well as essential therapeutic time for the complex rehabilitation process after a stroke.

Figure 1. Three patients with aspiration at different points of swallowing: before (A), during (B), and after (C) elicitation of the pharyngeal swallow.



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