Clinical Characteristics of Patients With Brainstem Strokes Admitted to a Rehabilitation Unit

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ABSTRACT. Teasell R, Foley N, Doherty T, Finestone H. Clinical characteristics of patients with brainstem stroke admitted to a rehabilitation unit. Arch Phys Med Rehabil 2002;83:1013-6.

Objective: To examine the clinical characteristics of patients with brainstem strokes admitted to a rehabilitation unit.

Design: Retrospective cohort. **Setting:** Inpatient rehabilitation unit.

Participants: Eighty-five consecutive admissions (56 men, 29 women; mean age, 61.9±14.4y; range, 18–85y) with radiologically confirmed focal evidence of specific lesions within the pons, midbrain, cerebellum, and medulla.

Interventions: Not applicable.

Main Outcome Measures: Various clinical characteristics, including stroke-related deficits and stroke risk factors, were identified and compared between brainstem subgroups. The incidence of complications, including pneumonia, deep vein thrombosis, and seizure disorder, was also reported.

Results: Seventy (82%) of the strokes resulted from infarctions and 15 (18%) were caused by hemorrhages. The functional deficits of hemiparesis, ataxia, and diplopia were present in 41 (48%), 73 (86%), and 32 (38%) patients, respectively. Dysarthria was reported in 42 patients (49%) and dysphagia in 40 (47%). Pneumonia during hospitalization was a complication in 9 (11%) of the patients with brainstem stroke. The risk factors of diabetes and hypertension were present in 22 (26%) and 47 (55%) patients, respectively. Fourteen (17%) of these patients had suffered a previous stroke.

Conclusions: Rehabilitation patients experience a variety of functional impairments as a consequence of brainstem stroke. These include hemiparesis, dysarthria and dysphagia, diplopia, and ataxia. A significant number of patients had pneumonia as a complication. The characteristics and impairment profiles of patients within the subgroups were similar, with the exception of the incidence of ataxia and hemiparesis.

Key Words: Cerebrovascular accident; Brain stem infarctions; Rehabilitation,

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LTHOUGH THERE IS extensive literature on the reha-A bilitation of patients with strokes affecting the cerebral hemispheres, there is a paucity of literature on the rehabilitation of patients with brainstem strokes. Patients with brainstem strokes have a different set of clinical symptoms and challenges in comparison to patients with hemispheric strokes. We previously reported1 that patients with brainstem strokes were admitted to a rehabilitation unit less frequently than hemispheric stroke patients. This may be because, in part, of the fact that brainstem strokes are less common overall, although their true incidence is not known.2 Additionally, patients with brainstem strokes may experience minimal functional or cognitive deficits after stroke and thus require rehabilitation less frequently. These patients are typically discharged home directly from the neurologic service. Alternatively, patients who experience catastrophic brainstem stroke, typically pontine, have either low survival rates or profound deficits that preclude their participation in rehabilitation programs.

Brainstem strokes are often categorized into different syndromes, depending on the vascular territory involved.³ Specific impairments resulting from brainstem strokes include dysarthria and dysphagia; contralateral hemiparesis or hemisensory deficits; diplopia; and ipsilateral cerebellar deficits, characterized by ataxia and incoordination.³ Many of these impairments have been classified into well-defined syndromes, including Wallenberg syndrome (lateral medulla) and Raymond-Cestan syndrome (lower pons), suggesting that the presentation of clinical syndromes is also well defined. However, this is often not the case.

Chua and Kong² noted that mixed or incomplete clinical syndromes are more often encountered among brainstem stroke patients admitted to rehabilitation units than are classical brainstem syndromes. Brainstem infarctions are often described as patchy and do not follow the theoretic distribution of a major artery. Milikan et al⁴ noted that most brainstem syndromes have limited clinical application. They suggested that this may be because of overlap between the arteries that supply the brainstem and individual variations in collateral circulation. In a comprehensive review of brainstem and cerebellar strokes, Hommel and Besson³ provided evidence of the relationship of symptoms to anatomic location. However, they acknowledged that the syndromes may be incomplete, symptoms may be poorly localized, and multiple areas may be commonly involved.

The primary goal of this study was to examine the clinical characteristics of brainstem stroke patients admitted to a rehabilitation unit. Secondary goals were to determine if localization of the stroke to particular, well-accepted anatomic regions within the posterior fossa would be associated with specific functional impairments, which would, in turn, determine the patient's rehabilitation needs.

METHODS

A chart review was conducted of 563 stroke patients consecutively admitted to the rehabilitation unit at the University Campus of the London Health Sciences Centre in London, Ont, over a 10-year period (1986–1996). Radiographic imaging

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