

Risk Factors for Pneumonia in Patients With Acute Stroke

To the Editor:

In their recent study, Hilker et al found a 21% incidence of nosocomial pneumonia in acute stroke patients treated on a neurological intensive care unit.¹ Independent risk factors were mechanical ventilation, multiple lesion and vertebrobasilar stroke, dysphagia, and abnormal chest x-ray on admission. Patients with intercurrent pneumonia had a higher mortality and a poorer functional outcome than patients without pneumonia. Although these results are of great significance and will have a substantial impact on the acute care of stroke patients, we nevertheless would like to address 2 important points.

First, although the authors applied different scores for evaluating the patients' clinical status, they did not use these findings when determining independent risk factors for pneumonia. One of the most important clinical features putting patients at an increased risk of pneumonia is a decreased level of consciousness.²⁻⁴ Pathophysiologically, this condition leads to (1) an attenuation of protective reflexes, (2) an impaired functioning of the lower esophageal sphincter and a delayed gastric emptying, and (3) a worsening of the coordination of breathing and swallowing, thereby predisposing the individual to aspiration independent of the underlying disease.⁵ In our opinion it would therefore be interesting to investigate whether a decreased level of consciousness was also independently associated with pneumonia in the present study. Additionally, it would be of clinical relevance to compare the risk attributable to a decreased level of consciousness with the risk attributable to the overall clinical stroke severity, which was measured by the authors with the NIH Stroke Scale.

Second, there is a continuing debate about risks and benefits of tube feeding in dysphagic stroke patients. On the one hand, nasogastric tubes are generally recommended as a safe way to supply nutrition in these patients.⁶⁻⁸ Thus, in a study on postacute stroke patients, Nakajoh et al found that the frequency of pneumonia was significantly higher in dysphagic patients with oral feeding than in those with tube feeding.⁹ On the other hand, there is contrary evidence that nasogastric tubes may predispose patients to aspiration.¹⁰ This is believed to be secondary to increased oropharyngeal secretions, impairment of laryngeal elevation, and disruption of the upper and lower esophageal sphincters.¹¹ Contributing to this important controversy, the authors of the present study could investigate whether dysphagic patients with tube feeding had a higher risk to acquire pneumonia than those with oral or parenteral feeding.

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Response

We appreciate the interest of Dr Dziewas and colleagues in our article describing the implications of nosocomial pneumonia after acute stroke for neurological intensive care medicine. In general, we agree with their objections but we wish to add 2 comments:

(1) The authors correctly stated that a decreased level of consciousness was identified as an important risk factor for pneumonia development in stroke patients. The results of our study provided comparable evidence, since significantly decreased Glasgow Coma Scale values within the first 3 days of NICU treatment were obtained in subjects with pneumonia compared with nondiseased subjects. From statistical reasons, we did not include metric Glasgow Coma Scale (as well as NIHSS and APACHE II) values in the multivariate regression analysis in order to avoid an excessive number of independent a priori variables. Otherwise our sample size of 124 patients and 26 subjects with pneumonia would not have been large enough to override problems with multiple comparisons, because it was suggested that the number of events should be at least 10 times the number of potential prognostic factors investigated.¹

(2) We are also aware of the ongoing controversy about risks and benefits of tube feeding in stroke patients with dysphagia. We agree with Dziewas et al that further data are needed to overcome this problem, but we believe that our observational data are not capable to provide helpful information on this topic. In our NICU, nearly all dysphagic patients are transiently treated with a nasogastric tube (NGT) so that only insufficient data are available on pneumonia incidence in dysphagic stroke patients without a NGT. To decide on the NGT-associated risk for pneumonia, a prospective interventional study randomized in stroke patients with and without this hypothetical risk factor should be performed.

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Stroke. 2003;34:e105; originally published online July 10, 2003;

doi: 10.1161/01.STR.0000083465.17164.AB

Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

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Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:

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