Swallowing and Cough Reflexes After Onset of Stroke

To the Editor:

Recently, we have observed that both the swallowing and cough reflexes were markedly depressed in patients suffering from aspiration pneumonia.\(^1\)\(^2\) Stroke is one of the major causes of aspiration pneumonia,\(^3\) and the use of antibiotics has therefore been recommended during the acute phase of stroke.\(^4\) However, most studies on reflexes protecting the lower respiratory tract have been started 1 month after stroke.\(^5\)\(^6\) We examined whether depression of the swallowing and cough reflexes occurred in patients after onset of stroke compared with age-matched control subjects.

The 20 control subjects (10 men and 10 women, with a mean age of 64 (SE, 1) years) were healthy volunteers who led active daily lives. The 10 patients (7 men and 3 women, with a mean age of 65 (SE, 4) years) were admitted with a diagnosis of stroke due to cerebral infarction. A stroke was defined as the sudden onset of neurologic dysfunction consistent with a vascular region of the brain that resulted in a neurologic deficit persisting for 24 h or more. Diagnosis of cerebral infarction was made on the basis of computed tomographic (CT) scans obtained within 1 day after admission and follow-up CT scans. All patients had revealing CT scans; eight patients had left hemisphere lesions, and two had right hemisphere and brainstem lesions. When the ten patients were admitted, five were not able to eat and walk by themselves, and five were able to eat with support and to maintain a sitting position by themselves. At the end of studies, five patients were able to eat and walk by themselves, and five patients were able to eat with support and to maintain a sitting position by themselves.

Cough response to citric acid was evaluated by determining the cough threshold, as reported previously.\(^1\) The swallowing reflex was evaluated on the basis of the latency of response, which was timed from the injection of 1 ml of distilled water into the pharynx through a nasal catheter to the onset of the swallowing action.\(^7\) Both the swallowing and cough reflexes were examined once a week for 4 weeks from the seventh day after the onset of stroke. To eliminate any diurnal variation in responses, the studies were done at the same time of day.

The latent time of swallowing was 1.0 (SE, 0.1) s, and the threshold concentration of citric acid was 1.6 (SE, 0.3) mg/ml in the control subjects. At 1 week after the onset of stroke, the latent time of swallowing was longer and the threshold concentration of citric acid was higher in patients than in control subjects (Fig 1). The latent time of swallowing in patients recovered to the same level as that in control subjects at 3 weeks after the onset of stroke. Although the threshold concentration of cough reflex became low with time after onset of stroke, it remained abnormally high in patients compared with control subjects at 4 weeks after the onset of stroke.

The present study shows the combined depression of the swallowing and cough reflexes during the first 2 weeks after the onset of stroke. Careful management in this period would help to prevent aspiration pneumonia. However, the cough reflex was not restored to the normal level 4 weeks after the onset of stroke. Therefore, attention is still needed 1 month after the onset of stroke even when patients are able to eat either with support or by themselves.

Hiroaki Kobayashi, M.D.,
Mortoashi Hoshino, M.D.,
Kenji Okayama, M.D.,
Kiyohisa Sekizawa, M.D., and
Hidetada Sasaki, M.D., F.C.C.P.,
Department of Geriatric Medicine,
Tokoku University School of Medicine,
Sendai, Japan

REFERENCES

4 Wynne JW, Modell JH. Respiratory aspiration of stomach contents. Arch Intern Med 1977; 87:466-74