

Bukuryoingohangekobokuto may improve recurrent aspiration pneumonia in patients with brain damage and reduce the caregiver burden

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ABSTRACT

A 17-year-old girl with hypoxic encephalopathy was hospitalized over four times in a year because of recurrent aspiration pneumonia (AP). She had dysphagia and reduced cough reflex as sequelae of brain damage. To prevent aspiration, a gastric tube was placed for feeding, but it did not reduce the frequency of AP because the gastroesophageal reflux caused backflow. However, after the Kampo medicine bukuryoingohangekobokuto (BRIHK) was added to the prescriptions, her sputum and gastroesophageal reflux was remarkably reduced. BRIHK is a Kampo medicine that confers multiple benefits such as improving swallowing and cough reflexes, reducing sputum, and improving gastric emptying. Subsequently, the frequency of sputum suction reduced from every 15 min to 30 min, thus reducing the burden on her mother. As a result, she has never been hospitalized for AP in the 7 years after treatment. Overall, BRIHK may be a treatment of choice for similar patients.

Keywords: Aspiration pneumonia, brain damage, bukuryoingohangekobokuto, hypoxic encephalopathy, Kampo medicine

Introduction

Aspiration pneumonia (AP) is one of the causes of death in patients with brain damage. It is characterized by impaired swallowing and cough reflexes, and gastroesophageal reflux of stomach.^[1] Swallowing and cough reflexes are mediated by endogenous substance P, which is regulated by dopaminergic neurons in the cerebral basal ganglia. Moreover, peristalsis of the stomach is regulated by the vagus nerve. Thus, damage to these brain structures frequently results in AP. Caregivers provide

oral care and suction sputum to prevent AP, thereby increasing the burden of care. Herein, we report a patient with hypoxic encephalopathy with frequent AP who was successfully treated with Kampo medicine.

Case History

A 17-year-old girl with hypoxic encephalopathy after drowning was hospitalized four times in a year because of recurrent aspiration pneumonia. Figure 1 shows the chest X-ray of the patient when she admitted with AP. She had dysphagia and reduced cough reflex as sequelae of hypoxic encephalopathy, with a level of consciousness of E2V1M2 on the Glasgow Coma Scale 5. Her mother had been burdened with performing repeated suction every 15 min. Her oxygen saturation decreased, and fever elevated if the suction was delayed. To prevent aspiration, a gastric tube

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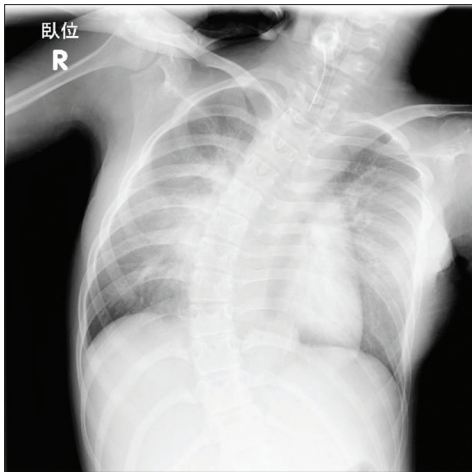


Figure 1: Chest X-ray of the patient with pneumonia at admission

was placed for feeding. However, it did not reduce the frequency of pneumonia because regular peristalsis of the stomach was poor, and the gastroesophageal reflux caused backflow of the fed content, as evaluated by gastrostomy imaging. However, after the Kampo medicine Bukuryoingohangekobokuto (BRIHK) was added to her treatment regimen, her sputum and gastroesophageal reflux was remarkably reduced. Figure 2 shows the constant agent gastrography; the contrast agent remains in the stomach [Figure 2a] and moved to the duodenum after the administration of BRIHK [Figure 2b]. Subsequently, the frequency of sputum suction was reduced from every 15 min to 30 min, thus reducing the burden on her mother. As a result, she has not been hospitalized for pneumonia in the 7 years since the treatment.

Discussion

BRIHK is a Kampo medicine formulated using bukuryoin and hangekobokuto (HKT) with multifunction in brain and organs. HKT has been proven to improve swallowing and cough reflexes and reduce sputum.^[2-4] HKT modulates cerebral levels of 5-hydroxytryptamine, noradrenaline, and dopamine resulting improving cough and swallowing reflexes.^[5] HKT reduced pneumonia risk in older adults with dementia and it is recommended secondary prevention of aspiration pneumonia in clinical practice guidelines.^[6-10] On the other hand, bukuryoin improves gastric emptying. BRIHK can inhibit corticotropin-releasing hormone receptor 2, dopamine receptors D2 and D3, neuropeptide Y receptor type 2, and acetylcholinesterase, which synergistically improve gastric emptying.^[11] Recently, an exploratory study of the clinical effectiveness and safety of BRIHK has been in progress.^[12] In conclusion, BRIHK can reduce the frequency of aspiration pneumonia by reducing dysphagia, cough reflex, and gastroesophageal reflux associated with brain damage. Many patients develop AP as a sequela of brain damage, and BRIHK may be a treatment of choice for these patients.

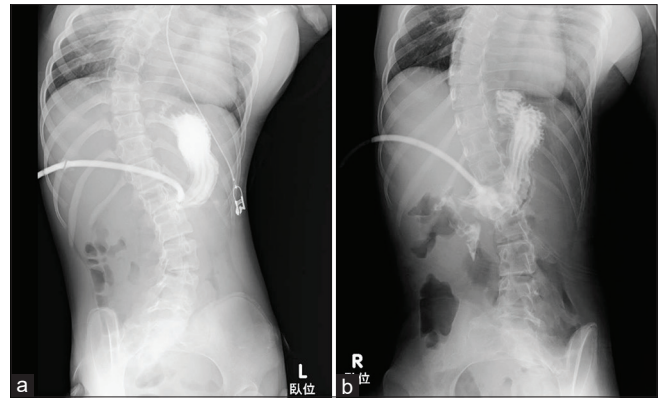


Figure 2: (a): Gastrography through gastrostomy before the administration of BRIHK. The contrast agent remains in the stomach. (b): Gastrography through gastrostomy 10 months after the administration of BRIHK. The contrast agent smoothly moved to duodenum.

Key Messages

Primary care physicians have many treatment options for treating aspiration pneumonia in patients with brain damage. Multifunctional Kampo medicine BRIHK may be a treatment of choice for these patients.

Ethical and institutional permission

Informed consent was obtained from mother of patient. This case report was approved by the Institutional Review Board of Tohoku University School of Medicine (No. 19906).

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Conflicts of interest

S. T., A. K., and T. I. belong to the Department of Kampo and Integrative Medicine, Tohoku University School of Medicine. The department received a grant from Tsumura & Co, a Japanese manufacturer of Kampo medicine which was used as per Tohoku University rules.

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