Impairment of the swallowing reflex in exacerbations of COPD

An exacerbation of chronic obstructive pulmonary disease (COPD) has a serious impact on disease progression and is associated with high medical costs, but the cause of about one-third of exacerbations cannot be identified. Adequate protective reflexes in the airways play an important role in the prevention of aspiration of bacteria-containing oropharyngeal or gastric secretions. Impairment of these reflexes, such as the swallowing reflex, therefore represents a potential risk factor for exacerbations of COPD. We have conducted a cross-sectional survey to evaluate the prevalence of impairment of the swallowing reflex in patients with COPD and to determine whether this is a risk factor for COPD exacerbations.

Fifty clinically stable patients with COPD were enrolled from the outpatient clinic of Ishinomaki Red Cross Hospital, Ishinomaki, Japan. Patients who were current smokers and those with oral corticosteroid use, oral and pharyngeal cancer, previous head and neck surgery, neuromuscular disease and oesophageal disease were excluded. Twenty-five patients (22 men and 3 women) had at least one exacerbation during the previous year, while the other 25 patients (21 men and 4 women) were stable. In the exacerbation group, the patients had 2.4 (range 1–10) exacerbations per year, and 20 patients (80%) required hospital admission. There was no significant difference between the stable group and the exacerbation group in age (mean (SE) 75.0 (1.3) years vs 77.2 (1.0) years), forced expiratory volume in 1 s (FEV1) (mean (SE) 1.11 (0.11) l vs 1.07 (0.09) l), percentage predicted value of FEV1, (mean (SE) 47.1 (3.7%) vs 50.1 (3.7%) and the rate of home oxygen therapy (4% vs 20%). All patients were eating an entire oral diet without complaining of dysphagia prior to enrolment.

We evaluated the swallowing reflex on the basis of the latency of response to the onset of the swallowing action timed from the injection of 1 ml distilled water into the pharynx through a nasal catheter. The mean (SE) latency time of the swallowing reflex was significantly longer in the exacerbation group than in the stable group (8.6 (1.3) s vs 2.6 (0.3) s, p<0.001; fig 1). We classified a response as normal or impaired according to whether the swallowing reflex was induced within 3 s of the injection. In the exacerbation group 22 of 25 patients (88%) exhibited an impaired swallowing reflex, while in the stable group 3 (12%) exhibited an impaired swallowing reflex (p<0.001). Impairment of the swallowing reflex was significantly associated with an exacerbation of COPD (relative risk 2.8, 95% confidence interval 1.5 to 5.0).

These results indicate that there is a high incidence of impairment of the swallowing reflex in patients with COPD and this is a risk factor for an exacerbation of COPD. To date, there are few published reports available on swallowing dysfunction in patients with COPD. The impact of impairment of the swallowing reflex in COPD exacerbations has not been clarified. The findings of our study highlight a novel risk factor for exacerbations of COPD and raise the possibility that precaution against aspiration could be useful to prevent these exacerbations.

Acknowledgements

The authors thank Dr Naoya Fujino for data collection.

Seiichi Kobayashi
Department of Respiratory Medicine, Ishinomaki Red Cross Hospital, Ishinomaki, Japan

Hiroshi Kubo
Department of Geriatrics and Respiratory Medicine, Tohoku University School of Medicine, Sendai, Japan

References


Intravascular air and CT

Dr Ku and co-workers wrote an interesting article describing a patient with air embolism in the superior vena cava surrounding a central venous catheter (CVC) and bilateral pulmonary opacities recognised on contrast enhanced chest CT. The round pulmonary opacity was noted on chest radiograph soon after insertion of the CVC. From these findings, they suggest that this is a rare case of venous air pulmonary infarction mimicking round pneumonia. However, further evidence should be obtained to support this assumption.

CT is highly sensitive for the detection of small amounts of intravascular air, which can be found in the central veins in up to 23% of patients on contrast-enhanced CT. The round pulmonary opacity noted on chest radiograph soon after insertion of the CVC is compatible with an air embolus in the venous system, although it is unclear whether this was due to air embolus or aspiration of air during intravenous injections (fig 1).

Normal lung tissue receives dual blood supply from pulmonary and bronchial arteries. Pulmonary infarct is infrequent after acute obstruction of the pulmonary artery because the bronchial circulation plays an important role.

Figure 1

Air bubble trapped around the central venous catheter in the inferior vena cava (arrow) was incidentally noted on non-enhanced CT scan of the abdomen.