

Usefulness of sivelestat sodium administration in patients with aspiration pneumonia

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To the editor: We experienced three cases of aspiration pneumonia that we managed successfully, preventing the development of widespread lung injury, by administering sivelestat sodium (sivelestat), a neutrophil elastase-inhibitor. In all three patients, sivelestat was administered 12 h or less after aspiration, and improvement of signs and symptoms of inflammation was recognized within 7 days.

Case 1

A 52-year-old man (140 cm; 40 kg), with a past history of cerebral paralysis, had intestinal obstruction (due to intestinal invagination caused by colon cancer) requiring emergency surgery. Aspiration, attributable to impaired consciousness, was confirmed immediately before surgery. Right colectomy and partial resection of the small bowel were performed under general anesthesia. Sivelestat administration was started 12 h after the aspiration. The initial dose was $0.2 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$, and an antibiotic (meropenem trihydrate) was administered concurrently to target anaerobic bacteria. WBC decreased after day 3, while the C-reactive protein (CRP) level peaked on day 4 and then decreased. Chest radiography also showed improvements, and the tracheal tube was removed on day 7. During this time, the $\text{Pa}_{\text{O}_2} / \text{F}_{\text{I}\text{O}_2}$ (P/F) ratio did not deteriorate. Sivelestat administration was discontinued when the tracheal tube was removed, but inflammation, did not recur.

Case 2

A 7-year-old boy (107 cm; 21 kg) with a history of spina bifida, myelomeningocele, and ventriculoperitoneal (V-P) shunting for hydrocephaly was admitted because of clouded consciousness caused by shunt dysfunction associated with shunt-tube

infection. He underwent shunt removal and cerebral ventricle drainage. Aspiration after vomiting caused by increased intracranial pressure was confirmed. Sivelestat administration was initiated 2 h after the aspiration. As the patient was a child, a lower dose, $0.1 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$, of sivelestat was administered, with the same antibiotic as that used in case 1. As with case 1, WBC and CRP levels both decreased after day 3, and the P/F ratio improved dramatically. Chest radiography showed marked improvements, and the tracheal tube was removed on day 7.

Case 3

A 3-year-old boy (102 cm, 20 kg) with a history of surgical arachnoid cyst removal experienced convulsions, followed by aspiration and cardiopulmonary arrest. We administered $0.1 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$ sivelestat, with the same antibiotic as for case 1, 7 h after aspiration. While chest radiography confirmed marked lesions, significant improvements were seen in inflammatory processes starting on day 3 of administration, and radiography showed apparent improvements. However, he displayed acute cerebral swelling resulting in cerebral ischemia and died about 1 month later.

Once widespread inflammation occurs, aspiration pneumonia is very difficult to treat. Sivelestat is a specific inhibitor of neutrophil elastase [1,2], and many studies have documented its usefulness in treating acute lung injury. In the three patients described above, we assume that, when sivelestat was administered during the early stages of the inflammatory process of aspiration, inflammation was suppressed, avoiding the onset of pneumonia. Needless to say, it is also important to start administering relevant antibiotics during the early stage. We suggest that the early administration of sivelestat could facilitate the successful management of patients with aspiration pneumonia, preventing its development into severe lung injury.

References

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