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Case report

CASE REPORT

Tranilast, an antifibrotic agent and COVID-19-induced pulmonary fibrosis

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Learning point for clinicians

- Pulmonary fibrosis is one of the inconvenient complications of COVID-19 pneumonia.
- We report a case of hypoxemic patient after COVID-19 pneumonia was successfully treated with antifibrotic agent trainlast.
- Six months of trainlast administration showed remarkable amelioration of lung fibrosis and recovery of the patient's lung function.

Case report

A 62-year-old man, an ex-smoker, with severe pneumonia after COVID-19 was transferred to our hospital for rehabilitation after 20 days of acute-phase treatment with nasal high-flow oxygenation and oral corticosteroids. He had been receiving nasal oxygen at a rate of 3 l/min with the addition of tiotropium bromide hydrate inhalation. The oral prednisolone dosage was decreased and discontinued 1 week after hospital admission. Chest computed tomography (CT) after acute-phase treatment showed architectural distortion, bronchiectasis and honeycombing suggestive of pulmonary fibrosis (Figure 1A and B). Treatment with the oral antifibrotic agent tranilast (600 mg t.i.d.) was initiated. Subsequently, the oxygen demand decreased, and the patient was discharged from our hospital with no need for supplemental oxygen. Chest CT performed at 2 months after the initiation of trainlast therapy revealed remarkable amelioration of lung fibrosis (Figure 1C and D). The forced vital capacity (FVC) improved from 1.69 l (67.1%, expected value) to 3.04 l (70.3%), and the forced expiratory volume in the first second (FEV1) improved from 1.89 l (53.4%) to 2.42 l (77.3%). The treatment with tranilast was prolonged for an additional 4 months resulting in further reduction of lung fibrosis (Figure 1E and F). Both FVC and FEV1 recovered remarkably, reaching 3.78 l (100.0%) and 3.16 l (100.9%), respectively.

Discussion

Hypoxemia could persist after severe COVID-19 pneumonia; according to the World Health Organization data, one-third of COVID-19 survivors worldwide developed significant pulmonary fibrosis.[1] However, its successful treatment remains a clinical challenge. A 6-month treatment regimen with tranilast, an antiallergic and antifibrotic agent reduced pulmonary fibrosis and improved respiratory function in a patient with post-COVID-19 severe pneumonia. Vadasz *et al.*[2] reported the benefit of systemic corticosteroids as a therapeutic modality for patients with severe organizing pneumonia after COVID-19, although prolonged treatment is necessary. Tranilast has been approved in Japan for treating bronchial asthma, allergic rhinitis, keloids and hypertrophic scars. This medication reduces keloid scar formation by inhibiting the neutrophil production of metalloproteinases and tissue inhibitors of metalloproteinase-1.[3] Results from experimental models have shown that tranilast inhibits fibrosis in obliterative airway disease[4] and experimental diabetic cardiac

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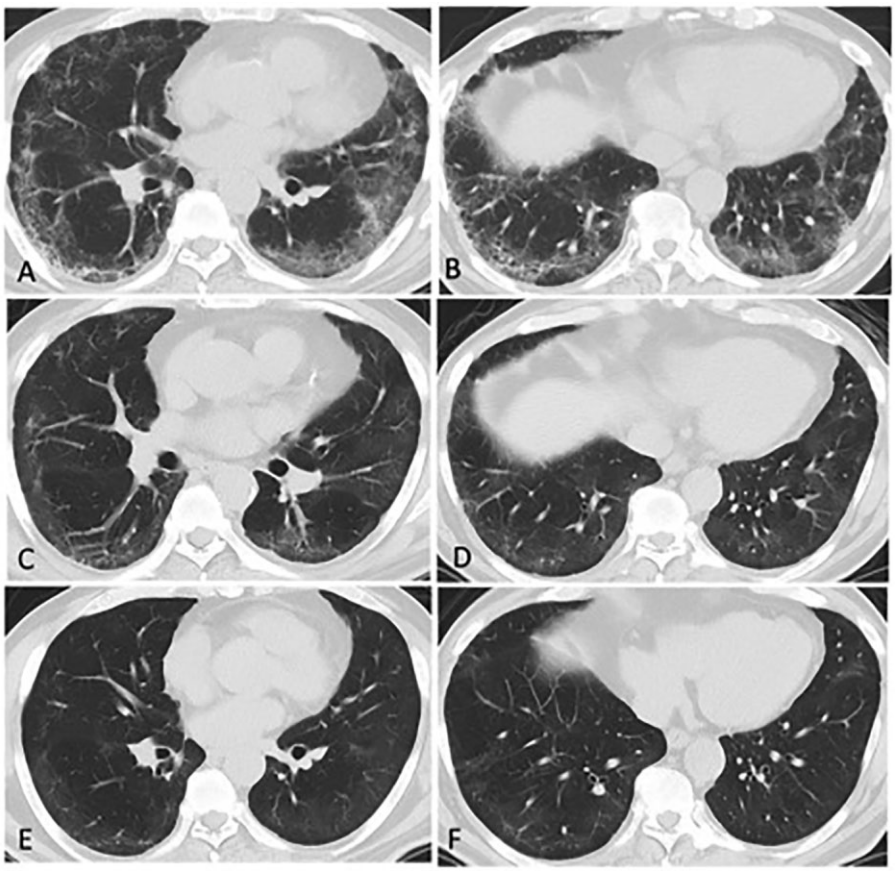

Figure 1. (**A** and **B**) Pulmonary fibrosis after acute-phase treatment of COVID-19 pneumonia. (**C** and **D**) Remarkable improvement in pulmonary fibrosis after treatment with tranilast for 2 months. (**E** and **F**) Additional 4-month treatment with tranilast shows further pulmonary improvement.

disease.[5] In addition, a long-term prospective study showed a preventive effect of tranilast on stricture progression in patients with Crohn's disease.[6] Pulmonary fibrosis and respiratory function improved remarkably in this patient with post-COVID-19 severe pneumonia after six months of treatment with tranilast. Thus, tranilast could be a candidate for treating post-COVID-19 organizing pneumonia.

Conflict of interest. None declared.

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