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Hydrogen/oxygen mixed gas inhalation improves disease severity and dyspnea in patients with Coronavirus disease 2019 in a recent multicenter, open-label clinical trial

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Introduction

Coronavirus disease 2019 (COVID-19) has resulted in more than 8.7 million laboratory-confirmed cases and 0.46 million deaths globally (1). Few therapies, if any, have been shown to rapidly ameliorate the respiratory symptoms and prevent against the disease progression. An important mechanism contributing to dyspnea and disease progression in patients with COVID-19 might be the increased work of breathing because of the heightened airway resistance (2). Inhalation of hydrogen/oxygen mixed gas (H₂-O₂) might have a role in the treatment of COVID-19 given the decreased resistance compared with room air when passing through the airways.

Methods

Recently, we conducted an open-label multicenter clinical trial, between January 21st and March 23rd, 2020, among

patients with laboratory-confirmed COVID-19 from seven hospitals in China. The patients were aged 18–85 years, and had dyspnea both on hospital admission and at enrollment [See Online Supplement (<http://dx.doi.org/10.21037/jtd-2020-057>) for patient sources, inclusion/exclusion criteria and outcome measures].

Trial Registration: www.clinicaltrials.gov, No. NCT04378712.

Randomization was not applied because of the urgency to deal with the outbreak. Patients were assigned to treatment group and control group at the discretion of attending clinicians. On the basis of standard-of-care (3), patients in treatment group inhaled H₂-O₂ (66% hydrogen; 33% oxygen) at 6 L/min via nasal cannula by using the Hydrogen/Oxygen Generator (model AMS-H-03, Shanghai Asclepius Meditec Co., Ltd., China) daily until discharge [see Figure E1 in Online Supplement (<http://dx.doi.org/10.21037/jtd-2020-057>)]. Patients in control group received standard-of-care (with oxygen therapy each day) alone until discharge. Clinical assessments included the five-category ordinal scale [see Panel

