

CASE REPORT

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A Case of Suspicious Allergic Reaction to Peracetic Acid Following Endoscopy

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A 43-year-old man with rheumatic arthritis was admitted to our hospital for symptoms of cough, left chest pain, and left elbow pain, and further examination revealed an elevated level of C-reactive protein. On day 2 after admission, he underwent esophagogastroduodenoscopy. On the morning of day 7, he developed a high fever of 39.7°C, several hours after bronchoscopy. On day 13, he underwent colonoscopy. Five minutes after the colonoscopy, he developed a high fever of 39.9°C, accompanied by stridor, indicating a decrease in arterial oxygen saturation level. An intradermal test for peracetic acid which was used for cleaning flexible endoscopy was positive. We suspect that he suffered from an allergic reaction to peracetic acid following the flexible endoscopy. This is the first case reported on suspicious allergic reaction to peracetic acid following a flexible endoscopy procedure. **Clin Endosc 2020;53:743-745**

Key Words: Allergy; Asthma; Disinfectant; Endoscopy; Peracetic acid

INTRODUCTION

Infection control using high-level disinfectants is indispensable for safe endoscopic examinations. The Food and Drug Administration (FDA)-approved high-level disinfectants commonly used for flexible gastrointestinal endoscopy include glutaraldehyde, ortho-phthalaldehyde, and peracetic acid. Although these disinfectants have been recommended in several guidelines for infection control during endoscopy,¹⁻³ they are associated with a slight risk of allergic reactions in patients and

medical staff. Both glutaraldehyde and ortho-phthalaldehyde have a slight risk of causing asthma and allergic reactions.⁴⁻⁷ A few cases of occupational asthma due to the use of a peracetic acid-hydrogen peroxide mixture have been reported.⁸⁻¹⁰ We herein report the first case with suspicious allergic reaction to peracetic acid following a flexible endoscopy procedure.

CASE REPORT

A 43-year-old man visited the local hospital after experiencing numbness in his arm and shoulder. He had a medical history of bronchial asthma and had no prior history of undergoing endoscopy. The data from his laboratory tests showed an elevated C-reactive protein (CRP) level. The patient was diagnosed with rheumatic arthritis, and treated with prednisolone at 10 mg/day and methotrexate at 8 mg/week. Pain was relieved and his CRP level normalized. Four months later, he developed a cough, left chest pain, and left elbow pain. He went to another local hospital, where he was found to have an elevated CRP level. He was referred and admitted to our hos-

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pital for further examination.

The patient continued to take the prescribed prednisolone at 10 mg/day, but he discontinued the methotrexate. On day 2 after admission, he underwent esophagogastroduodenoscopy following throat local anesthetic with lidocaine and premedication injection of scopolamine butylbromide. He had no clinical symptoms after the examination. On the morning of day 7, he underwent bronchoscopy and trans-bronchial lung biopsy after bronchus local anesthetic with lidocaine and the premedication injection of atropine sulfate and midazolam. He developed a high fever of 39.7°C several hours after the bronchoscopy. He was treated with antibiotics and an antipyretic based on the initial diagnosis of aspiration pneumonia, and fever was resolved by the treatment over 4 days. On day 13, he underwent colonoscopy following the premedication of scopolamine butylbromide. Five minutes after the colonoscopy, he developed a high fever of 39.9°C, with stridor indicating a decrease in arterial oxygen saturation level. A series of such clinical episodes made us consider that he was suffering from some kind of drug-induced allergic reaction. He was then, treated by methylprednisolone, and hydrocortisone combined with oxygen inhalation, antipyretics, chlorpheniramine maleate, and famotidine. His symptoms disappeared the next day.

In our hospital, every flexible endoscope is cleaned, disinfected, rinsed, and reprocessed with automated washer disinfectors (OER-2 and OER-4; Olympus Co., Tokyo, Japan) using peracetic acid. The esophagogastroduodenoscope and the bronchoscope undergo disinfection using the same disinfectors (OER-2), but the colonoscope undergo disinfection using another disinfectant (OER-4). We checked every automated endoscope disinfectant and could find no malfunction. Therefore, a prick test using chemical agent of peracetic acid as well as suspected medications including atropine sulfate, lidocaine, midazolam, and scopolamine butylbromide was performed, but it was negative for all agents. In contrast, an intradermal test was positive for peracetic acid at 1:10,000 dilution while being negative for other agents. We, thus, suspected that peracetic acid was responsible for the patient's drug-induced allergic reaction and advised him to avoid undergoing endoscopic examination with an endoscope disinfected by peracetic acid. In our monitoring investigation, the residual concentration of peracetic acid in the flexible endoscopes of our hospital was within the permissible level. The environmental concentrations of peracetic acid in our endoscopic laboratory were also below the detectable limit.

DISCUSSION

We have herein reported the first case of a patient with suspicious allergic reaction to peracetic acid following flexible endoscopy. Infection control using high-level disinfectants is necessary for safe endoscopic examination. As for cleaning flexible endoscopes, FDA-approved high-level disinfectants including glutaraldehyde, ortho-phthalaldehyde and peracetic acid are commonly used.¹⁻³ Both glutaraldehyde and ortho-phthalaldehyde have been reported to cause occupational asthma.⁴⁻⁷ In contrast, since peracetic acid is a low-molecular-weight compound with low allergenicity, cases of allergic reactions to peracetic acid have been rare, though a few cases of occupational asthma due to the use of a peracetic acid-hydrogen peroxide mixture have been reported.⁸⁻¹⁰

Peracetic acid is a commonly used high-level disinfectant for flexible endoscopy, and in Japan it is more frequently used than glutaraldehyde and ortho-phthalaldehyde. In our hospital, the flexible endoscopes are consistently cleaned, disinfected and reprocessed with the automated washer-disinfectors using peracetic acid. Every cycle of precleaning, brushing, cleaning, rinsing, drying, leak testing, and storage are properly performed according to a multi-society practice guide for gastrointestinal endoscopes reprocessing procedures.³ Based on our hospital investigation, no peracetic acid exceeding the threshold value was detected in the use of flexible endoscopes. This indicates that medical conditions induced by peracetic acid in the present case may be attributed to an allergic reaction rather than an irritant reaction. It has also been reported that peracetic acid may play a role as a hapten.⁷

Although the present case had a medical history of bronchial asthma, he showed no symptoms during the first series of endoscopic examination. It seems that he was sensitized by the peracetic acid during the first endoscopy and developed the allergic reaction to the peracetic acid during the following endoscopic examinations. While this is a very rare case of a patient with a suspicious allergic reaction to peracetic acid following flexible endoscopy, we should be cautious of the possibility of an allergic reaction caused by peracetic acid in all clinical practices.

Conflicts of Interest

The authors have no financial conflicts of interest.

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