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CORRESPONDENCE

Anesthetic management of a patient allergic to ethylene oxide: a case report

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To the Editor,

A wide range of medical devices (MDs) used for anesthesia and surgery are sterilized using ethylene oxide (EO), which is a direct alkylating agent with bactericidal, virucidal, and sporicidal activity.[1] Other sterilization processes include irradiation and heat, but these techniques cannot be used for all MDs. Herein, we describe the management of a patient with hemophilia scheduled for spinal surgery and who was known to be allergic to EO. He had developed the allergy after multiple administrations of blood products related to his hemophilia.

To meet this patient's particular needs, we first established an inventory of the medical equipment required for his anesthesia and surgery. The hospital's pharmacy was contacted and asked to find alternative equipment, including MDs sterilized by irradiation. A large amount of the necessary material was available (sterilized by irradiation). Some devices, however, such as suction tubes, were available only with EO sterilization.

To use the EO-sterilized material safely, we applied the protocol developed by the Saint-Louis Hospital (Paris, France). It recommends choosing devices whose use has almost expired (i.e., as close as possible to the expiration date) and to rinse them with sterile saline to remove any remaining EO.

One hour was required to prepare the operating room before the patient entered, during which time all EO-sterilized material was removed and replaced by the substituted devices. We completely purged the anesthesia machine and prepared the necessary EO-sterilized devices (e.g., arterial line, intravenous infusion set, suction catheters). All tubes were flushed with 3 L of a sterile saline solution. Other materials were successively rinsed in three consecutive baths of sterile saline solution, with each bath lasting 15 min.

The entire team was prepared to face an emergency situation if necessary, including treatment of anaphylaxis. We assembled the staff to review the checklist before the patient entered the operating room.

A private room in the postoperative care unit was reserved for the patient, and the nurse in charge of the patient was briefed. These many steps were taken to prevent any mistakes during the post-anesthesia recovery. No complications were encountered during or after the surgery.

The prevalence of allergy to EO might be underestimated as it is sometimes confused with an allergy to latex.[2] To date, few cases of EO allergy have been described in the literature. This allergy is, in most cases, acquired by repeated exposure to EO-sterilized materials. Patients on prolonged hemodialysis or those suffering from spina bifida are at higher risk than the overall population. Marshall et al. reported that 12% of their dialysis patients had a positive skin test to EO.[3] Among children suffering from spina bifida, 23% had direct antibodies against EO.[4]

The nephrology community has already been sensitized to use fewer EO-sterilized MDs. Anesthesiologists also should be more aware that patients with an EO allergy could have a reaction during the perioperative period.

Currently, there are many single-use devices on the market. Hence, there is a growing need to raise awareness in the medical community about the risk of an increasing incidence of EO allergy.[5]

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Figure Protocol for patients allergic to ethylene oxide (EO)

- Make an inventory of medical devices (MDs) necessary for the procedure
- Substitute, if possible, the EO-sterilized MDs (recognizable by : **STERIL EO**)
- If non-EO-sterilized MDs are not available :
    - Use EO-sterilized MDs as close as possible to the expiration date.
    - Rinse the MDs with three sterile saline baths (15 minutes per bath).
    - Purge all tubings with 3 litres of sterile saline.

There are preventive measures that can be taken for surgical interventions in such patients. The key points to consider are the following: (1) find alternative equipment to avoid exposure to EO, especially when treating a patient with a chronic disease, thereby limiting the risk of sensitization; and (2) establish a protocol (as illustrated in the Figure) that is available when needed in each institution.

Conflicts of interest None declared.

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