Anaphylaxis Due to Poloxamer 238

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We present a clinical case of anaphylaxis due to poloxamer 238. Poloxamers are recognized pharmaceutical excipients that can be used in micellar form to increase both the solubility and the stability of drugs. In addition to their use in drug delivery, poloxamers have also been reported to sensitize drug-resistant cancers to some antineoplastic drugs, thus increasing transport of the drugs across the blood-brain barrier and enhancing oral bioavailability [1].

The patient was a 59-year-old woman, with a history of bronchial allergic asthma and sensitization to olive and *Parietaria* pollen.

In November 2016, she was diagnosed with breast cancer. During the radiological examination to detect a sentinel lymph node, a marker with Tc99m (Nanocoll) was administered intravenously. In less than 15 minutes, the patient began to experience itching and intense erythema in the groins, neck, mouth, and lips, followed by swelling of the tongue, dizziness, sweating, and intense dyspnea. She needed emergency care, which took the form of epinephrine, dexchlorpheniramine, and methylprednisolone. The patient was then transferred to hospital, where she recovered after hours of treatment and observation in the emergency department.

Intravenous Nanocoll is a radiopharmaceutical containing Tc99m in the form of sodium pertechnetate with nanocolloid human serum albumin and poloxamer 238.The other excipients are anhydrous glucose, stannous chloride dihydrate, sodium phosphate, anhydrous sodium phytate, and nitrogen.

The results of skin prick testing and intradermal testing with human albumin were negative. Skin prick testing and intradermal testing (1:1000) with poloxamer 238 were positive (Figure).

The results of prick and intradermal testing with poloxamer 238 were also negative in 5 controls.

We then performed dot-blot IgE-immunodetection, which yielded negative results. No specific IgE binding to the material analyzed was detected [2], although specific IgE to other pharmaceutical excipients has been reported using this technique [3].

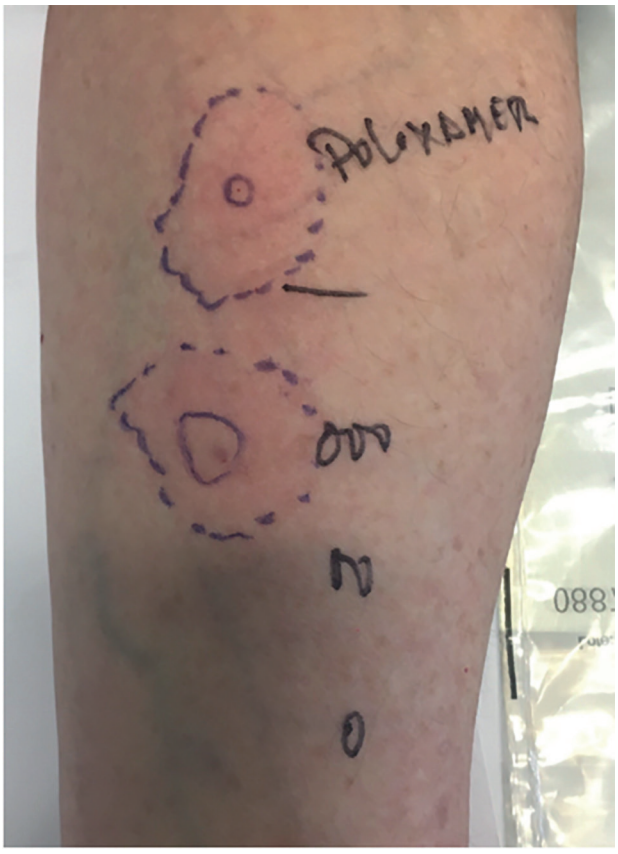

Figure. Positive skin prick test and intradermal test (1:100) with poloxamer 238.

A subsequent histamine release test showed that 22 ng/mL of histamine was released when poloxamer 238 was added to the patient's basophils, in comparison with 14 ng/mL, when we simply added the buffer that accompanies the technique (negative control). Therefore, the release of histamine generated with the drug that caused the symptoms exceeded the positivity cut-off of the technique (15 ng/mL), and the result of the test was considered positive. 7% $HClO_4$ was used as positive control [4-6].

Adverse non–IgE-mediated hypersensitivity reactions have been described following intravenous injection of poloxamer 188–based pharmaceuticals, presumably via complement activation [7].

To our knowledge, we present the first case of anaphylaxis due to poloxamer 238 administered with a radiopharmaceutical causing clinical symptoms and in which histamine release was demonstrated.

We were unable to demonstrate specific IgE binding using the dot-blot technique, although the positivity of the skin test suggests that an IgE-mediated mechanism could be involved.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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