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Case report

Red man syndrome caused by vancomycin powder

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ABSTRACT

Red man syndrome (RMS) is a well-known hypersensitivity reaction caused by intravenous administration of vancomycin, with symptoms ranging from flushing, erythematous rash, pruritus, mild to profound hypotension, and even cardiac arrest. RMS has not previously been described from local application of vancomycin powder in a surgical wound, a technique increasingly utilized for infection prophylaxis in many surgical disciplines including neurosurgery. We describe the first reported case of RMS as a result of local intra-wound application of vancomycin powder for infection prophylaxis. A 73-year-old male with a history of Parkinson's disease underwent 2-stage deep brain stimulation implantation surgeries. Vancomycin powder was applied locally in the surgical wounds for infection prophylaxis during both of the surgeries. The patient developed a well-demarcated, geometric erythematous pruritic rash following the second surgery that was clinically diagnosed as RMS and resolved without sequelae.

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1. Introduction

Local application of vancomycin powder in surgical wounds for infection prophylaxis has gained increasing popularity in many surgical disciplines, including neurosurgery, and has been shown to reduce the incidence of surgical site infections [1,2]. Red man syndrome (RMS) is a well-known histamine-mediated hypersensitivity reaction involving mast cells and basophils and is caused by intravenous administration of vancomycin [3,4]. The symptoms range from flushing, to erythematous rash, pruritus, mild to profound hypotension, and even cardiac arrest [3–5]. The diagnosis is made clinically, and there are no serologic or histopathologic diagnostic criteria. Serum histamine levels are known to be highly variable and unreliable [4]. Here we describe the first reported case of RMS as a result of local intra-wound application of vancomycin powder for infection prophylaxis.

2. Case report

A 73-year-old male with a history of medically refractory Parkinson's disease underwent two-stage deep brain stimulation (DBS) implantation surgeries. The first surgery involved bilateral stereotactic placement of subthalamic nucleus DBS electrodes via two small frontal incisions. A small amount of vancomycin powder

(approximately 200 mg per side) was placed into each frontal incision. He received intravenous cefazolin intraoperatively and for 24 h postoperatively. The postoperative course was unremarkable. The second outpatient surgery was completed 10 days after the first surgery in which an implanted pulse generator was placed in the right chest and the DBS electrodes were connected to the generator via extension cables. Again, 500 mg of vancomycin powder was divided and placed into the right frontal, parietal, and infraclavicular wounds prior to closure. The patient received one dose of cefazolin intraoperatively, and was prescribed oral cephalexin for 24 h postoperatively.

Several days after the second surgery, the patient noted a well-demarcated, geometric erythematous pruritic rash on his chest (Fig. 1). He was evaluated by dermatology, and this was felt to be focal RMS, a localized histamine-mediated hypersensitivity reaction most likely due to intraoperative use of vancomycin powder (and not cefazolin) since there was a clear rash demarcation and localization around the pulse generator wound. The diagnosis of RMS was made clinically, without further serologic or histopathologic studies. The patient did well with symptomatic treatment, and the rash completely resolved over the following week without sequelae.

3. Discussion

Local intra-wound application of vancomycin powder has been shown to be effective in reducing the incidence of surgical site infections, and has been increasingly utilized in many surgical

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Fig. 1. Photograph of the patient several days after the second operation showing the erythematous segmental rash involving the chest and upper abdomen. Note the surgical scar in the right infraclavicular region.

specialties, including neurosurgery [1,2]. RMS is a well-known histamine-mediated hypersensitivity reaction classically caused by intravenous administration of vancomycin [3,4], although there have been very rare reports of RMS associated with oral or intraperitoneal administration of vancomycin [6–9]. To our knowledge, this is the first reported case of RMS caused not by intravenous, oral, or intraperitoneal administration of vancomycin but by local intra-wound application of vancomycin powder for infection prophylaxis.

Importantly, mast cells and basophils, but not immunoglobulin IgE, are involved in the RMS reaction, and the process is at least partially mediated by histamine release [4,10]. Therefore, it is

important to differentiate RMS from a true medication allergy. Since the pathophysiology of RMS does not involve an immunoglobulin IgE component, vancomycin would not be considered a medication allergy and can be re-used safely.

Disclosure

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

Sources of support

None.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.jocn.2018.01.044>.

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