Can J Anesth/J Can Anesth (2020) 67:913–914
https://doi.org/10.1007/s12630-020-01598-4

CORRESPONDENCE

Assessing the need for a chlorhexidine-containing central venous catheter: balancing the risk of anaphylaxis with infection

Christopher L. Pysyk, MD, FRCPC · Donald R. Miller, MD, FRCPC

Received: 6 January 2020 / Revised: 7 January 2020 / Accepted: 7 January 2020 / Published online: 25 February 2020

To the Editor,

We thank Ho *et al.* for their important case series identifying the risk of anaphylaxis in patients undergoing renal transplantation with a chlorhexidine-impregnated central venous catheter (CVC).[1] A case with many similarities to those presented by the authors resulted in a patient safety incident report reviewed by the Quality and Patient Safety (QPS) committee[2] at our academic health sciences centre. Following QPS committee assessment of the event, including discussion with the anesthesiologist involved as well as review of the medical record and pertinent published literature, the recent case series by Ho *et al.* in the *Journal* was helpful in identifying anaphylaxis to chlorhexidine-containing CVC as the likely cause of the hypotension noted in our patient. This event prompted urgent, multidisciplinary stakeholder collaboration to seek possible solutions to prevent future events. In addition, the QPS committee-directed review found that all triple-lumen CVCs available at our centre contained chlorhexidine. Discussion with colleagues in other departments and clinical areas where CVCs are commonly inserted (e.g., emergency department, intensive care unit, surgical/medical units) revealed limited knowledge that chlorhexidine, the third most common cause of perioperative anaphylaxis,[3] was embedded in triple-lumen CVCs used at our centre. Messaging from the QPS committee about the risk of chlorhexidine-induced anaphylaxis with triple-lumen CVC insertion, particularly in patients with fistula-dependent hemodialysis, was provided to all relevant clinicians and trainees.

While messaging is important and one of the most commonly used processes to advance safety through education, its effectiveness is limited compared with other system-focused strategies.[4] The approach suggested by Ho *et al.* to reduce anaphylaxis risk among patients receiving dialysis targets the source of the issue—i.e., preventing immunologic sensitization by using non-chlorhexidine skin antisepsis for fistula-mediated dialysis.[1] Undoubtedly, however, there are a number of existing patients "in the system" who may present for renal transplantation fully primed for chlorhexidine anaphylaxis should they receive a chlorhexidine-containing CVC, despite the aforementioned prevention strategy. A different solution for consideration, and backed by the hierarchy of effectiveness of change,[4] involves elimination of and/or provision of alternatives to the inciting agent, in this case, chlorhexidine-containing CVCs.

While antibiotic-impregnated CVCs are supported by the Center for Disease Control to reduce CVC-related infections,[5] it is important to note that antimicrobial CVCs do not apply to all clinical units in all institutions for all patients. Specifically, it is recommended to use impregnated CVCs when "hospital units or patient populations have a central line-associated bloodstream infection (CLABSI) rate above institutional goals despite compliance with basic CLABSI prevention practices."[5] Moreover, "antimicrobial CVCs may have no additional benefit in patient care units that have already established a low incidence of catheter infections."[5] As such, avoidance and/or alternatives to chlorhexidine-containing CVCs may

This letter is accompanied by a reply. Please see Can J Anesth 2020; 67: this issue.

C. L. Pysyk, MD, FRCPC (✉) · D. R. Miller, MD, FRCPC
Department of Anesthesiology and Pain Medicine, Faculty of Medicine, The Ottawa Hospital, and University of Ottawa, Ottawa, ON, Canada
e-mail: cpysyk@toh.on.ca

be justified based on the local CLABSI rate and practice profile.

Conflicts of interest None.

Funding statement None.

Editorial responsibility This submission was handled by Dr. Hilary P. Grocott, Editor-in-Chief, Canadian Journal of Anesthesia.

References

1. *Ho A*, *Zaltzman J*, *Hare GM*, *et al*. Severe and near-fatal anaphylactic reactions triggered by chlorhexidine-coated catheters in patients undergoing renal allograft surgery: a case series. Can J Anesth 2019; 66: 1483-8.
2. *Pysyk CL*, *Filteau L*, *Baxter A*. Quality and patient safety committee structure and activities in an academic department of anesthesiology: a narrative description. Can J Anesth 2020; 67: 100-8.
3. *Royal College of Anaesthetists.* Anaesthesia, Surgery and Life-Threatening Allergic Reactions. Report and findings of the Royal College of Anaesthetists' 6th National Audit Project: Perioperative Anaphylaxis. May 2018; Available from URL: https://www.nationalauditprojects.org.uk/downloads/NAP6%20Report%202018.pdf (accessed January 2020).
4. *Trbovich P*, *Shojania KG*. Root-cause analysis: swatting at mosquitoes versus draining the swamp. BMJ Qual Saf 2017; 26: 350-3.
5. *Marschall J*, *Mermel LA*, *Fakih M*, *et al*. Strategies to prevent central line–associated bloodstream infections in acute care hospitals: 2014 update. Infect Control Hosp Epidemiol 2014; 35: 753-71.