

PUBLISHED ABSTRACT

Standard of Care Not Met? Monitoring and Dosing of Vancomycin is Error-Prone

Ashton C. Lai, Derek K. Kong, Katherine Liu, Songhon Hwang, Sen Ninan, Patricia Saunders-Hao and Vinh-Tung Nguyen

Icahn School of Medicine at Mount Sinai, US

Corresponding author: Ashton C. Lai (ashton.lai@mountsinai.org)

Keywords: vancomycin; quality improvement; antibiotic; MRSA

Background

Vancomycin is a commonly used antibiotic for the empiric coverage of gram-positive organisms in sepsis, in particular when methicillin-resistant *Staphylococcus aureus* (MRSA) is suspected. Given the narrow therapeutic index of vancomycin, a trough level is drawn prior to the administration of the 4th dose as a surrogate for the area under the curve. Our hospital's current clinical practice relies on the collaboration of ordering providers, nursing staff and clinical pharmacists to have a vancomycin trough level drawn and dose adjusted properly; however, this process is highly susceptible to error, with patients often misdosed. Here, we sought to quantify the frequency of errors and identify areas for improvement.

Methods

We performed a single-center retrospective study with 46 patients admitted to medicine and otolaryngology floors in November 2019 who received at least 4 doses of vancomycin. We excluded those who were dosed as vancomycin by level and those who received vancomycin at outside facilities prior to transfer to the Mount Sinai Hospital. An in-depth chart review was performed to determine whether patients had timely trough levels drawn and whether the subsequent dose was adjusted appropriately. Those who had a vancomycin trough level drawn 15–60 minutes prior to the 4th dose of vancomycin were considered to be appropriately monitored while those who had the 5th dose of vancomycin adjusted were considered to be properly dosed.

Results

Of the total 46 patients, only 3 patients (8.5%) had vancomycin trough levels drawn within 15-60 minutes prior to the 4th dose of vancomycin. Of the 3 patients who had vancomycin troughs drawn correctly, only one was appropriately adjusted. With process mapping and an Ishikawa diagram, we have identified potential barriers to meeting standard of care (**Figures 1 and 2**).

Conclusions

Despite its narrow therapeutic window, vancomycin levels are not currently monitored or adjusted properly on both medicine and otolaryngology floors. Our data suggest that clinical interventions are urgently required to address this hospital issue as standard of care is currently not being met. Meanwhile, we hope to determine how often supratherapeutic vancomycin has resulted in adverse outcomes. We also hope to develop interventions that may aid our providers, nursing staff and clinical pharmacists in monitoring and dosing vancomycin appropriately.

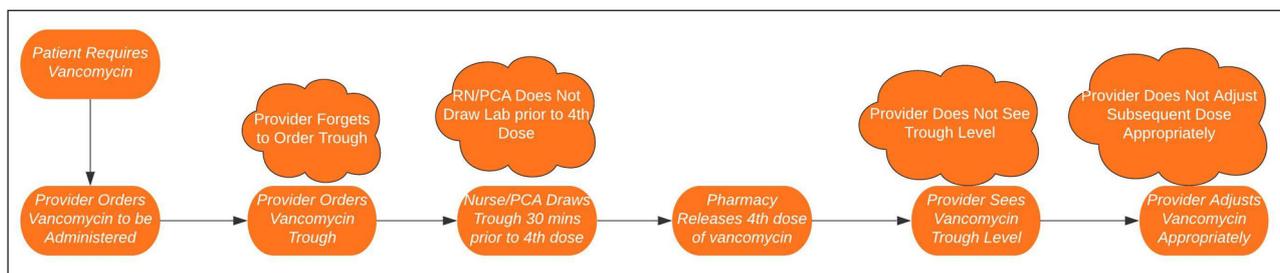


Figure 1: Flowchart of Current Process for Vancomycin Dosing.

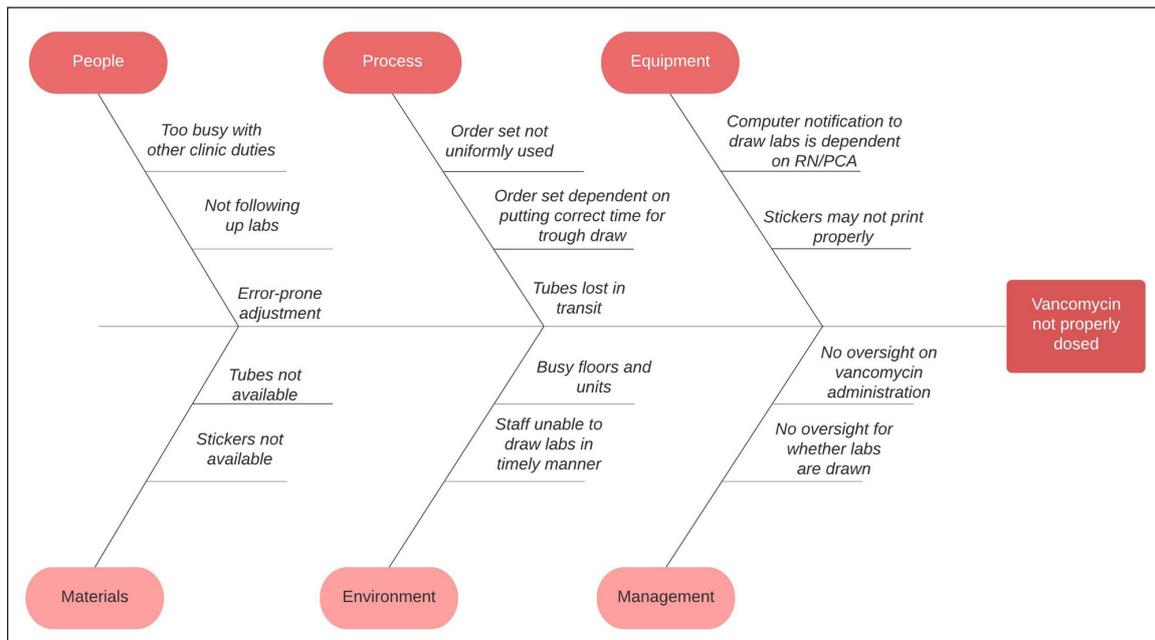


Figure 2: Fishbone Diagram for Vancomycin Misdosing.

How to cite this article: Lai AC, Kong DK, Liu K, Hwang S, Ninan S, Saunders-Hao P, Nguyen V-T. Standard of Care Not Met? Monitoring and Dosing of Vancomycin is Error-Prone. *Journal of Scientific Innovation in Medicine*. 2020; 3(3): 2. DOI: <https://doi.org/10.29024/jsim.73>

Submitted: 11 June 2020 **Accepted:** 11 June 2020 **Published:** 17 July 2020

Copyright: © 2020 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.

