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Letter to the Editor

Impact of change in vancomycin-resistant *Enterococcus* infection prevention policy

Christopher R. Kiss MBBS[1,2], Susan Ryan MN[1], Jacky Meyer GradCert (InfCont)[1], Despina Kotsanas MClinEpi[2], Allen C. Cheng PhD[2,3] and Rhonda L. Stuart PhD[1,3]

[1]Department of Infection Prevention and Epidemiology, Monash Health, Clayton, Victoria, Australia, [2]Monash Infectious Diseases, Monash Health, Clayton, Victoria, Australia and [3]Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, Victoria, Australia

To the Editor—Vancomycin-resistant *Enterococcus* (VRE) is a nosocomial pathogen of clinical importance, given increasing healthcare-associated infection rates since its discovery in 1988 and limited treatment options.[1] A widely adopted infection control practice, recommended by the Centers for Disease Control and Prevention (CDC), is active surveillance for colonization of high-risk patients, with isolation and contact precautions for colonized individuals, to reduce transmission, subsequent colonization, and invasive infection with VRE.[1] Despite widespread implementation, underlying evidence is conflicting.[2] Some studies demonstrate no significant impact on invasive VRE infection rates, despite cessation of single-room isolation and contact precautions.[3,4] We evaluated the impact of ceasing active surveillance, single-room isolation, and contact precautions for VRE-colonized patients, as well as change in cleaning procedure, on the rate of invasive VRE infection in our institution.

We conducted this retrospective study in a 640-bed (majority shared rooms), tertiary-level teaching hospital in Melbourne, Australia. Prior to July 2019, surveillance was performed on the renal ward and intensive care unit (ICU) with admission, weekly, and discharge screening rectal cultures to identify VRE colonization. The screening positivity rate was ∼10%. VRE-colonized patients were kept in single-room isolation with contact precautions hospital-wide. Both practices were ceased hospital-wide in July 2019. Those with fecal incontinence or diarrhea (regardless of VRE status) were managed under contact precautions during both periods. Chlorhexidine gluconate bathing is performed in the ICU. Hand hygiene compliance over the study period was variable but maintained at >80%.

Additionally, cleaning procedures changed in 2020. Prior to that change, environmental daily cleaning was performed with dampened reusable microfiber cloths; discharge cleaning was performed with additional steam; and equipment was cleaned with disposable microfiber cloths and water only. From early 2020 onward, this procedure was gradually changed to chlorine-based disinfectant (1,000 ppm sodium hypochlorite/hypochlorous acid)-dampened reusable microfiber cloths for environmental discharge and daily cleaning, with quaternary ammonium-impregnated wipes to clean equipment. Invasive VRE infection was defined as VRE isolation from a sterile site or surgical sample. In patients with multiple VRE-positive specimens, samples within 6 weeks of the original positive culture were excluded. Urine cultures were excluded to avoid inclusion of perineal flora-contaminated samples.

We conducted an interrupted time-series analysis using the ITSA module in Stata BE (StataCorp, College Station, TX). The intervention period was the time after cessation of all VRE-specific precautions in the health service in July 2019. The dependent variable was the rate of VRE clinical isolates and blood-culture isolates per 1,000 occupied bed days, per month, in the health service. The preintervention and postintervention trends were estimated using linear regression. Standard errors were adjusted for autoregression at a 1-month lag using the Newey West method. This study was approved and exempted from human research ethics committee review by the Monash Health research office (no. RES-23-0000-185Q).

During the study period, there were 1,303,601 occupied bed days (OBD), 258 episodes of invasive VRE infection, and 121 episodes of VRE bacteremia. The mean age of affected patients was 67 years (SD, 12.34) before the intervention and 66 years (SD, 14.69) after the changes in management protocol. In the pre- and postintervention cohorts, patients were 66% and 62% male, respectively.

For 2017, 2018, and 2019 (the 3 years up to and including the change in management protocols), the rates of VRE infection per 1,000 OBDs were 0.221, 0.150, and 0.253, respectively. For the 3 years thereafter (2020, 2021, and 2022), the rates were 0.172, 0.186 and 0.200, respectively. Trends in VRE infection incidence did not change significantly after the change in protocols (see Fig. 1). For all clinical isolates, prior to the intervention, the trend was 0.013 events per 1,000 OBD per month (95% confidence interval [CI], −0.04 to 0.070; $P = .064$). A level change of −0.024 events per 1,000 OBD (95% CI, −0.141 to 0.093; $P = .68$) with a change in trend of −0.010 events per 1,000 OBD per month (95% CI, −0.072 to 0.052; $P = .75$) were noted following the intervention. Regarding only VRE bacteremia, the preintervention trend was 0.001 events per 1,000 OBD per month (95% CI, −0.002 to 0.004; $P = .49$), with a level change of 0.012 events per 1,000 OBD (95% CI, −0.058 to 0.081; $P = .738$) and trend of −0.002 events per 1,000 OBD per month (95% CI, −0.005 to 0.001; $P = .269$).

In summary, we performed a retrospective analysis of invasive VRE infection rates over a 6-year period to determine the impact of surveillance and isolation cessation for VRE colonization and

Corresponding author: Christopher Kiss; Email: c.r.kiss89@gmail.com

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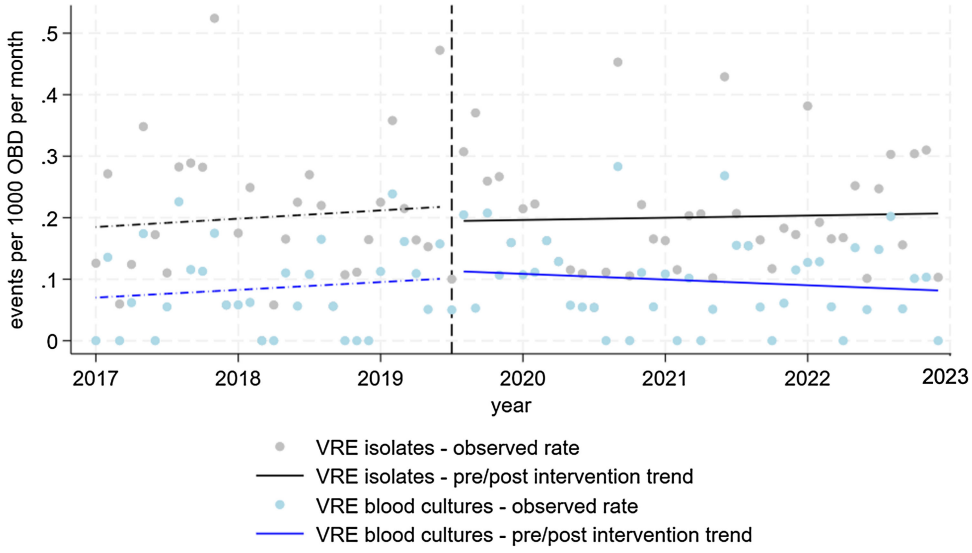

Figure 1. Rate and trend of VRE infection over time. The vertical line represents the month in which screening and isolation of patients with VRE was ceased hospital-wide.

change in hospital cleaning procedure. We found no significant change in invasive VRE infection rates, including bacteremia, following implemented changes. No statistically significant changes were observed in VRE-positive urine-culture rate (Supplementary Fig. 1 online). These findings contrast with those of Cho et al,[5] which demonstrated a significant increase in hospital-acquired VRE bacteremia following cessation of surveillance cultures on interhospital transfers. However, our findings support those of other studies that did not observe increased VRE infection rates following cessation of VRE specific interventions.[3,4]

This study had several limitations. It was nonrandomized, single-center, and retrospective in nature, which limits the generalizability of the results. Secondly, the COVID-19 pandemic coincided with the postintervention period, potentially introducing unmeasured confounding factors. Increased utilization of personal protective equipment, single-room isolation, modified antimicrobial prescribing, higher vigilance toward hand hygiene practices, and reduction of elective surgical procedures may have affected VRE infection rates.

Additionally, the impact on VRE transmission was not measured. Nevertheless, our study is the first to investigate the impact of a change in VRE infection control procedures in an Australian context, with comprehensive data collected over an extended period.

Given monetary and opportunity costs of infection control interventions,[6] without demonstrable impact on antimicrobial prescribing,[7] our results further support cessation of active surveillance, contact precautions, and isolation for VRE colonized patients.

Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/ice.2023.297

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