Effectiveness of Prudent Use of Vancomycin after a Vancomycin Resistant Enterococci (VRE) Outbreak in a Non-endemic, Tertiary Care Hospital

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Introduction

Antimicrobial stewardship program (ASP) of vancomycin enforced appropriate formulary prescription. The program was able to reduce VRE colonization and infection rate, as a part of a multifaceted intervention. Limited studies demonstrated effectiveness of ASP alone in decreasing incidence of VRE in healthcare settings.

Objective

The study examined effectiveness of prudent used of vancomycin and VRE incidence before and after the intervention. We also studied factors contributing to inappropriate prescription of vancomycin.

Materials and Methods

After a VRE outbreak in a 500-bed, university-affiliated, tertiary care hospital in Bangkok, during Jul 28-Sep 1, 2015, a multifaceted intervention was implemented including contact isolation precautions, active surveillance culture (ASC), cohorting patients who was colonized or infected with VRE, environmental decontamination with 1:100 sodium hypochlorite solution and hydrogen peroxide vapor, enhance hand hygiene compliance, and implementing vancomycin prescription restriction policy. We conducted a hospital-wide, prospective, quasi-experimental study for a 6-month period before intervention (period 1), a 2-month period of program implementation (period 2), and a 6-month period after intervention (period 3). No interventions were continued in period 3 except vancomycin prescription restriction policy.

We reviewed 304 prescriptions of vancomycin in hospitalized patients during these periods. Seventy-nine prescriptions were excluded (49 prescriptions during phase 2 of the study, 24 prescriptions for less than 48 hours of administration, and 6 prescriptions in patients age under 15). Twenty-one prescriptions were excluded because of incomplete data. We reviewed 204 prescriptions including 105 (51.5%) for pre-intervention and 99 (48.5%) for post-intervention.

Results

We compared appropriate used of vancomycin, based on Healthcare Infection Control Practices Advisory Committee (HICPAC) recommendation, between period 1 and 3. We used defined daily dose (DDD), recommended by World Health Organization (WHO), to compare in-hospital vancomycin utilization. We also compared incidence of VRE colonization/infections between these periods. Appropriate used of vancomycin was increased from 36.8% to 63.2% (42/105 vs. 73/99 prescriptions, OR 4.2 (95% CI 2.3-7.6) p<0.001). Decrease of vancomycin consumption was observed (-17.7%, 1.84 to 1.51 DDDS/100 bed-days, p=0.02).

Conclusion

Multifaceted interventions resulted in control of VRE outbreak. In non-endemic setting, vancomycin prescription restriction policy may be a key element in sustained reduction of VRE colonization and infection. Patients who were diagnosed as sepsis and on current hemodialysis should have been focused on vancomycin administration.

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