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Implementation and Evaluation of a Pilot Pharmacist-led Vancomycin Therapeutic Drug Monitoring Service in Queen Elizabeth Hospital

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Introduction

Vancomycin has been the drug of choice for Methicillin-resistant Staphylococcus aureus (MRSA) infection for decades. Individualized dosing is warranted for better treatment efficacy, improved patient safety and prevention of drug resistance.

Objectives

This study aims to implement and evaluate a pharmacist-led vancomycin therapeutic drug monitoring (TDM) service to optimize target vancomycin trough (VANT) achievement and to improve monitoring practice.

Methodology

This was a retrospective cohort study. VANTs of patients treated under standard usual care from Sep 2014 to Jan 2015 (historical control, CTRL) were compared to patients enrolled into a pilot pharmacist-led TDM program from Sep 2015 to Jan 2016 (intervention group, INTN). Adult patients in medical (MED) and orthopedic (ORT) wards who were newly initiated with intravenous vancomycin for suspected or culture-proven MRSA infections with at least one interpretable VANT were included. Patient with duration of follow-up less than 5 days or with renal replacement therapy were excluded. Individualized VANT target was suggested by Infectious Diseases specialists for eligible patients. Pharmacists then reviewed the initial vancomycin dosage and duration of infusion, recommended VANT monitoring schedule and subsequently monitored VANT values. Recommendation including dosage adjustment, VANT monitoring schedule and duration of infusion were made to case clinicians whenever necessary.

Result

A total of 106 patients, 52 in INTN and 54 in CTRL, were included in the analysis. As compared to control group, the time to first VANT target was significantly shorter in INTN (12.1 days vs 33.8 days; Hazard Ratio=4.873, $p < 0.001$). Subgroup analysis showed that the time to first VANT target in INTN was consistently shorter in both MED (11.0 days vs 23.6 days, p=0.005) and ORT (13.3 days vs 37.2 days, p=0.045). As compared to control group, VANT target attainment rate was higher in INTN (42.3% vs 16.7%; p=0.005; Number Needed to Treat=4).
The implementation of pharmacist-led vancomycin therapeutic drug monitoring service in target wards significantly reduced the time to first VANT target and increased VANT target attainment rate. Monitoring practice has also been improved that VANTs were measured at more appropriate and precise time.