Vancomycin Utilization in a Level IV Neonatal Intensive Care Unit (NICU)

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INTRODUCTION

Vancomycin is one of the frequently used antibiotics in the neonatal intensive care units (NICU). While its use is necessary for prevention or treatment of infections, misuse or overuse of vancomycin is associated with mortality and other adverse outcomes including emergence of vancomycin-resistant bacteria, invasive candidal infection, disruption of microbiomes and nephrotoxicity.

In 2015, collaboration between antimicrobial stewardship program (ASP) and NICU was initiated to assist clinicians in optimization of antimicrobial utilization.

METHODS

Retrospective chart review was conducted in NICU patients who received vancomycin between 1/1/2017 and 12/31/2017. Demographic of patients and microbiological data were recorded.

AIM

To evaluate the use of vancomycin in our NICU after implementing key changes in 2016, and determines further areas of improvement.

RESULTS

There were a total of 335 vancomycin courses administered to 175 infants (Table 1).

Most of vancomycin use (252/335, 75%) was discontinued at 48 hrs. Of these, no infants developed invasive gram-positive infections requiring reinitiating of vancomycin.

Microbiology of gram-positive bacteria isolated during this study is shown in Table 2.

Among those with continued vancomycin courses, more than half (46/83, 55%) occurred in the absence of evidence of resistant GPC infections. Commonly stated reason for continuation of vancomycin was the infants’ severity of illness.

Gram-positive bacterial infections treated with vancomycin are shown in Table 2.

Of the total 316 troughs drawn, 24 (7.5%) had subtherapeutic trough (<5) whereas 61 (19%) had supratherapeutic (>15).

Acute kidney injury (increase in serum Cr ≥ 1 time baseline) was found in 6 courses (1.8%), in which 4 courses (67 %) received vancomycin for ≤ 48 hrs.

Although the utilization rate of all antibiotics in our NICU has substantially decreased (Figure 1), the mean utilization rate of vancomycin in year 2017 was 72.6 per 1000 patients/day compared to those of previous years 2015-2016 (64 and 64.4, respectively) (Figure 2).

CONCLUSIONS

The majority of vancomycin use was consistent with our existing guidelines.

However, most of our vancomycin use was for 48h, questioning the value of empirical vancomycin for suspected sepsis in our NICU.

More judicious use of vancomycin could be improved if subsets of high risk patients could be identified for initiation of empirical vancomycin.

ASP team has an important role in improving antimicrobial use through providing expert advice and feedback on the appropriate use of antimicrobials and facilitated the adherence to the guidelines.

REFERENCES