Empiric Intraperitoneal Antibiotics for Peritonitis – Assessing the Concordance with Hospital Guidelines

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BACKGROUND

The use of intraperitoneal (IP) antibiotics for the treatment of peritoneal dialysis (PD)-related peritonitis may be a source of medication errors since the dosage, administration and monitoring is different to intravenous therapies. Body weight and residual renal function are important factors for calculating and adjusting doses.

According to local hospital guidelines, patients with suspected PD peritonitis should receive IP empiric antibiotics including:

- Gentamicin 0.6 mg/kg, capped at 50 mg and repeat if daily blood level < 2 mg/L;
- Vancomycin 30 mg/kg as loading dose and subsequent doses are administered at 15 mg/kg, if daily blood level < 15 mg/L. Dose should be increased by 25% if daily urine output is greater than 100 mL and capped at 2500 mg.

AIM

To assess the concordance of empiric antibiotic agents, dosage and therapeutic drug monitoring for inpatients with PD peritonitis with hospital guidelines.

METHODS

- A list of inpatients with suspected PD peritonitis between March 2016 and June 2017 was obtained from PD unit of a tertiary referral hospital.
- A retrospective analysis of admission records and pathology results was undertaken by a renal pharmacist.
- The appropriateness of therapy was assessed by comparing against hospital-approved guidelines published in March 2016.

RESULTS

- Fourteen patients met inclusion criteria.
- Body weight was documented in 86% (12/14) of admission records and residual renal function was recorded in 14% (2/14).
- All patients received IP gentamicin as gram-negative cover (14/14). Of these, 36% (5/14) of patients were prescribed appropriate dose(s) whilst 64% (9/14) of patients were prescribed inappropriate dose(s) (Figure 1).
- 93% (13/14) of patients received IP vancomycin as gram-positive cover and 7% (1/14) of patients received IP cefazolin (deviation from protocol).
- Vancomycin loading dose was under-prescribed in 69% (9/13) of cases (Figure 2) . No patient was prescribed appropriate maintenance dose(s) of vancomycin (Figure 2).
- 50% of patients received subsequent gentamicin (5/10) and vancomycin (4/8) at appropriate time intervals directed by daily blood levels.
- All patients received fungal peritonitis prophylaxis with oral nystatin.

DISCUSSION

- The appropriateness of IP antibiotics dosing and monitoring is paramount to ensure maximal treatment efficacy whilst minimising toxicity.
- This audit highlighted the prescribing of IP antibiotics may not be compliant with the local hospital guidelines.

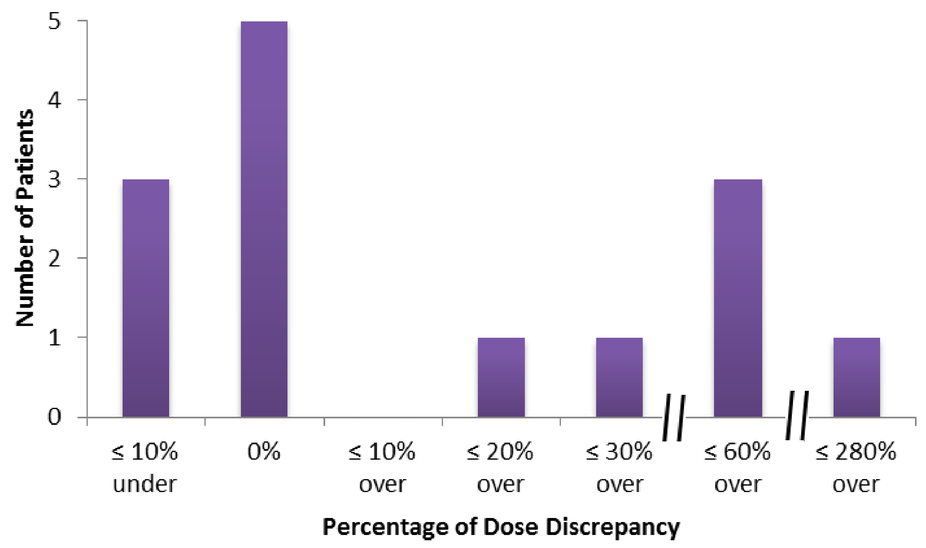

Figure 1: *Gentamicin dose discrepancy (the difference between prescribed and calculated dose) is expressed as a percentage of calculated dose (n = 14).*

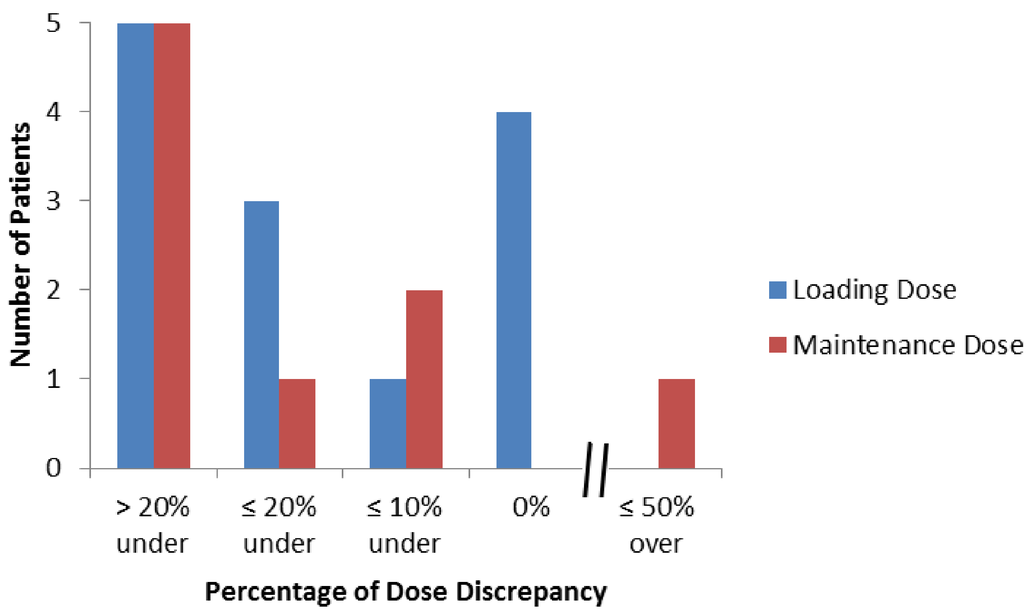

Figure 2:*Vancomycin dose discrepancy (the difference between prescribed and calculated dose) is expressed as a percentage of calculated dose. Blue bars represent loading doses (n = 13) and red bars represent maintenance doses (n = 9).*

DISCUSSION CONTINUED

- The potential limitation of this audit is the small sample size.
- The results of this audit were presented to the head of PD unit. Recommendations were made to improve the prescribing of IP antibiotics by providing regular education sessions targeting medical and nursing staff and making early referral to a pharmacist.
- Future direction may include conducting a repeat audit post implementation of the above recommendations.

CONCLUSION

This audit showed low adherence of IP antibiotics prescribing to local guidelines. It highlights the opportunity for a pharmacist to minimise medication errors surrounding the prescribing and monitoring of empiric IP antibiotics by conducting staff education and timely pharmaceutical review.

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