Therapeutic Drug Monitoring for glycopeptides and aminoglycosides: actual situation and perspectives in a French University Hospital

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Background

Optimising glycopeptides and aminoglycosides therapy with Therapeutic Drug Monitoring is recommended. Under-dosing can lead in resistance and ineffective treatment while over-dosing is associated with toxicity.

Purpose

The aim of the study is to evaluate the current practices of monitoring aminoglycosides and glycopeptides in a French university hospital: dosages (trough and peak concentrations) and percentage of optimal concentrations based on our inner antibiotics guide.

Materials and method

The Prescriptions of glycopeptides and/or aminoglycosides, for which at least one dosage has been realized, have been reviewed during one month (February 9th – March 15th 2012). Our data pool contains: patients' characteristics, infection and antibiotic background, serum concentration. We compared the serum concentrations we found in our hospital with the local guidelines (antibiotics guide) and other ones.

Results

We noticed that a large range of official optimal target serum concentrations are mentioned in the literature (Consensus Review of the American Society of Health-System Pharmacists, French Pharmacology and Therapeutic Society 2011, inner guidelines…) and the figures can be very discordant.

91 Prescriptions (31 aminoglycosides, 60 glycopeptides) have been analysed: the largest percentage is represented by vancomycin (55%) with 80% of continuous infusion.

- **VANCOMYCIN**
  - Continuous infusion regimens:
    - Optimal vancomycin concentrations [20-30] mg/L: 42%
    - Subtherapeutic vancomycin concentrations <20 mg/L: 33%
    - Subtherapeutic vancomycin concentrations <10 mg/L: 8%
  - Intermittent infusion regimens:
    - Optimal vancomycin concentrations [20-30] mg/L: 27%
    - Subtherapeutic vancomycin concentrations <20 mg/L: 54%
    - Subtherapeutic vancomycin concentrations <10 mg/L: 27%

- **AMINOGLYCOSIDS**
  - 50% of aminoglycosides trough concentrations were superior to values of inner guidelines
  - Target peak concentrations were not reached:
    - amikacin: 67% under 60mg/L ([60-80mg/L])
    - gentamycin: 90% under 30mg/L ([30-40mg/L])

- **TEICOPLANIN**
  - 10 prescriptions of teicoplanin have been reviewed. 70% of trough serum concentration was below 20 mg/L, 30% below 10 mg/L (inner guidelines: optimal trough concentrations = [20-30mg/L])

Conclusion

Most aminoglycosides and glycopeptid concentrations didn't achieve the therapeutic aim during this study. Consensus guidelines should be proposed to avoid bacterial resistance and guide clinical practices. Considering our results, a prospective study is under investigation in order to evaluate the practicing inside the medical units: when are the samples taken, how do the physicians adapt the doses to the results...?