CAN MODELLING ANTIBIOTIC USE BE A TOOL TO BETTER POLICY MAKING?

Nathalie Vernaz-Hegi1, Pascal Bonnabry1, Jacques Schrenzel2, Stephan Harbarth3
1Pharmacy, 2Laboratory of bacteriology, 3Infection Control Program, University Hospitals of Geneva (HUG), Switzerland

1) Model Theory

The relationship between drug consumption and clinical or ecologic effects is important, but difficult to measure. There is a need to develop modelling tools guiding policy changes. To determine the interest of modelling drug use, we examined the temporal relation between antibiotic use and the incidence of methicillin-resistant Staphylococcus aureus (MRSA) and Clostridium difficile in our tertiary care hospital.

2) Modelling: time series analysis

Using time series analysis, we performed a transfer model with aggregated data on antibiotic use. We assessed their effect on the incidence of clinical isolates of MRSA and C. difficile from February 2000 to September 2006. The WHO ATC/DDD classification was used as reference normalized per 100 patient-days (PD).

3) Result

From the 84% of total antibiotic use (average 33 DDD/100PD) analyzed, 38% showed to have a temporal relation with MRSA incidence (figure 1 and table 1) while no association was detected for C. difficile (figure 2).

4) Policy making

This study shows that modelling antibiotic use can inform policy makers about negative adverse effects of certain antibiotic agents on selection of MRSA and may ultimately guide control and prevention. Regarding our results, restriction of several broad-spectrum antibiotic agents might positively impact on MRSA. This method can also be applied to other classes of drugs.

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