 IMPORTANCE OF APPROPRIATE BEFORE-AND-AFTER QUASI-EXPERIMENTAL DESIGN TO EVALUATE THE IMPACT OF ANTIMICROBIAL STEWARDSHIP PROGRAMMES: COMPARATIVE RESULTS USING STATISTICAL HYPOTHESIS TESTING OR INTERRUPTED TIME SERIES ANALYSIS

6ER-025

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Objective
To compare results of an interrupted time series analysis (ITS) versus basic statistical hypothesis testing in a before-and-after study to evaluate the impact of Antimicrobial Stewardship Programmes (ASP) on cephalosporins consumption in a tertiary university hospital.

Methods
Quasi-experimental study

<table>
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<tr>
<th>Pre-intervention period</th>
<th>Intervention period</th>
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<tr>
<td>January 2013</td>
<td>February 2014 ASP Intervention</td>
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Data recorded
- Patients prescribed third/fourth-generation cephalosporins identified daily
- Impact of ASP on cephalosporins consumption

Statistical hypothesis testing
- U-Mann-Whitney test
- Mean and Standard Deviation (SD)

Interrupted Time Series regression analysis
- Longitudinal segmented regression (generalized least-squares)

For a time point equivalent to 2 years after ASP, relative differences between observed changes and estimated values expected in the absence of the intervention were calculated.

P-value<0.05 (two tails) was considered significant.

Study Results

STATISTICAL HYPOTHESIS TESTING

<table>
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<tr>
<th>Cephalosporins</th>
<th>Pre-Intervention</th>
<th>Intervention</th>
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<td>83.12</td>
<td>104.87</td>
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A significant increase (p<0.001) in cephalosporins consumption was shown in the intervention period.

INTERRUPTED TIME SERIES ANALYSIS

Intervention led to a significant change in trend, moving from a pre-intervention upward slope to an almost horizontal slope. 2 years after the ASP, a significant decrease was observed in measured consumption compared to the expected of -28.07%.

Conclusion
- Although both quasi-experimental designs showed significant changes in cephalosporins consumption after the intervention, the interpretation of results is contradictory.
- While hypothesis testing showed an increase after the intervention, ITS analysis revealed that this consumption was even less than expected. This suggests the programme may have been useful in reducing the consumption of these antimicrobials.
- A robust design is essential in ASP, enabling appropriate interpretation of results.