Impact of Implementing a Global Collaborative Physician-Pharmacist Strategy on Prophylactic Antibiotic Practices in a University Hospital Centre

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Abstract

Background Among different approaches to prevent surgical site infections, antibiotic prophylaxis is substantially important. According to previous published papers, surgical antibiotic prophylaxis (SAP) practices could be optimised by the implementation of isolated strategies.

Purpose
• To identify risk factors associated with non-compliance towards prophylactic antibiotic guidelines.
• To test the impact of a combined intervention strategy on compliance towards prophylactic antibiotic guidelines.

Material and methods A quasi-experimental study with a pre-test–post-test evaluation was carried out on five types of intervention: hip prosthesis, coronary artery bypass grafting, colorectal surgery, transurethral resection of the prostate and endoscopic retrograde cholangiopancreatography. Compliance with guidelines was evaluated in 11 criteria within the pre-test and intervention groups.

• In order to identify risk factors associated with non-compliance, a retrospective observational transversal study was carried out in the pre-test group using a multivariate statistical analysis (Wald test). Odds ratios for the relationships between each independent variable and the outcome variable were then determined.
• We tested a combined intervention strategy that included: the pre-operative delivery of nominative kits containing the antibiotics with a recommendation paper adapted to patient factors; a pharmacist participating in antibiotic stewardship team for compilation of guidelines and their distribution for implementation; audits; feedback; educational seminar and outreach visits; and the development of an internal computer-based decision tool. For comparison between the two groups (pre-test and intervention groups), data were analysed using $\chi^2$ and $t$ tests for, respectively, categorical and continuous data.

Results
The pre-test group (11 January 2016 – 22 April 2016) and the intervention group (9 January 2017 – 21 April 2017) included, respectively, 130 and 118 interventions.

• The multivariate statistical analysis showed, as in previous studies, that true penicillin allergy, certain types of surgery and some practitioners were associated with non-compliance within the pre-test group.

• Compared with the pre-test group, the compliance was significantly increased in the test group for all 11 criteria ($P<0.05$) and in terms of global compliance (42.4% vs 16.9%; $P<0.001$). This positive impact revealed a culture change, an interest and an awareness observed within the practitioner’s teams.

Conclusion This study shows that optimisation of SAP practices is achievable within a proactive multidisciplinary approach.

References
Background In Spain, in the past 6 months there has been a mean of 0.9 shortages per day. A piperacillin/tazobactam shortage was announced in April 2018 by the Spanish Agency of Medicine and Health Products (AEMPS). In May 2018 the AEMPS offered it as a foreign drug to Spanish hospitals but it ran out quickly. After that no alternative was available until July 2018, when the AEMPS offered it again as foreign drug. However, its defined daily dose (DDD) cost twice more than the national product alternative. At the end of June, the hospital ran out of stock until the end of September when the national product was restored.

On the other hand, since April 2014, an Antimicrobial Stewardship Programme (ASP) has been implemented in hospitalisation units (HU). One of this programme’s purposes is to work on the rational use of carbapenems. In this hospital carbapenems DDDs/100 bed days of HU were, in 2016 and 2017, 6.89 and 6.93, respectively.

Purpose The aim of this study is to analyse carbapenems exposure during piperacillin/tazobactam shortage in a tertiary care hospital.

Material and methods Carbapenems exposure was measured by DDDs/100 bed days 3 months before (April, May and June) and 3 months during the shortage (July, August and September), and furthermore expense variation was calculated. Carbapenems consumption, at HU and intensive care unit (ICU), was calculated.

Results

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<th>Abstract 4CPS-071 Table 1</th>
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<td><strong>Carbapenems</strong></td>
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During the shortage, carbapenems DDDs/100 bed days increased by 92% for HU and by 143% for ICU. This carbapenems DDDs/100 bed days rise cost an additional € 5300.

Conclusion These data show the huge impact of the piperacillin/tazobactam shortage in public health and economic resources.

The management of shortages should be a public health priority for European health authorities.

Also, this situation makes it difficult to get Antimicrobial Stewardship Programme purposes. Ecological impact must be evaluated after this excessive use of carbapenems.