

HAITool – a Co-Designed Surveillance and Decision-Support System to Enhance Antibiotic Stewardship Programs

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Abstract:

Background:

Healthcare-associated infections (HAIs) caused by antibiotic-resistant pathogens are linked with high levels of morbidity and mortality. To prevent and control antibiotic-resistant HAIs and antibiotic misuse, several strategies have been described: hand hygiene, surveillance information system, Antibiotic Stewardship Programs (ASP - programs to improve antibiotic use). However, to be effective, these strategies should be adapted to the context where they are being implemented.

Objectives:

To co-design and implement an information system, that impacts on antibiotic-resistant HAIs and antibiotic use, and is well adapted to Portuguese context. The information system should be based in the framework of ASP and be able to:

- Monitor antibiotic consumption;
- Monitor antibiotic resistant bacteria;
- Promote antibiotic prescription based on guidelines;
- Improve physicians' prescription behavior.

Methods:

The study is being conducted in Portuguese Hospitals and follows Design Science Research Methodology that aims to solve organisational problems by creating and evaluating information technology artefacts (e.g. information system).

Results:

In association with healthcare workers, we have co-designed HAITool, a surveillance and decision-support system adapted to Portuguese context. As surveillance system, HAITool includes integrated views of patient, microbiology and pharmacy data, displayed in innovative graphics presentation that enables the visualization of patient clinical evolution, antibiotic consumption trends, antibiotic-resistant infections distribution, and local antibiotic susceptibility patterns. HAITool is also a decision-support system for antibiotic prescription, displaying alerts in cases of antimicrobial therapy excess duration, not in accordance with microbiology results, without previous microbiological culture, and isolation of ESKAPE+C and multidrug-resistant microorganisms.

Conclusion:

HAITool is based on ASP framework and enables monitoring of antibiotic resistance, antibiotic use and helps antibiotic prescription since aggregate all the information in a single information system. HAITool is being already used in some Portuguese Hospitals and is considered as an important step forward to reduce antibiotic misuse and control and prevent antibiotic-resistant HAIs.