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Original article

How to improve the collection and analysis of hospital antibiotic consumption: Preliminary results of the ConsoRes software experimental implementation

Comment améliorer le recueil et l'analyse des consommations hospitalières d'antibiotiques : résultats préliminaires du déploiement en phase pilote de l'outil ConsoRes

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Abstract

Objective. – The online software ConsoRes is used to collect and analyze data on antibiotic consumption and evolution of bacterial resistance in healthcare institutions in every hospital ward (HW). We report the first results of ConsoRes implementation in the northeast hospitals of France.

Methodology. – ConsoRes was implemented in January 2011, in nine volunteer hospitals after performing an onsite assessment. Five of these hospitals were already monitoring antibiotic consumption with a network such as Raisin ATB or Antibiolor, providing feedback on the various evaluation tools.

Results. – The ConsoRes data collection import function meets expectations of pharmacists, bacteriologists, or clinicians since it is user friendly, prevents redundant data input, and allows data transfer to the national databases. Importing the hospital organizational structure prevents mistakes on consumption allocation, which was noted in the previous databases, and makes comparison and benchmark analysis reliable. ConsoRes also provides a rapid consumption data feedback to all registered users within the hospital, whether in charge of a ward (clinician) or having a transversal function (pharmacist, bacteriologist). The availability of an automatic standard report or of an online customized report is another major feature of ConsoRes.

Conclusion. – Besides providing surveillance, the concomitant analysis of local antibiotic consumption and bacterial resistance should have an educational impact by allowing each user to implement actions within the framework of antibiotic stewardship.

Keywords: Antimicrobial consumption; Antimicrobial resistance; Web-application

Résumé

Objectif. – ConsoRes est un outil web de recueil et d'analyse des consommations d'antibiotiques et de l'évolution des résistances bactériennes à chaque niveau fonctionnel d'un établissement de santé. Nous rapportons ici les premiers résultats de son déploiement en phase pilote dans le Nord-Est de la France.

Méthodologie. – Le déploiement a eu lieu en janvier 2011 dans neuf établissements volontaires après réalisation d'un bilan préalable sur site. Cinq de ces établissements réalisaient déjà la surveillance de leurs consommations via les réseaux Raisin ATB ou Antibiolor, permettant une comparaison des différents outils d'évaluation.

Résultats. – Concernant la saisie des données, ConsoRes via ses fonctions d'importation et d'exportation automatisées, répond à une forte attente de facilité et d'absence de redondance de saisies tout en permettant d'alimenter les bases nationales. L'importation de la structure de l'établissement

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évite des erreurs d'affectation des consommations constatées dans les autres bases rendant pertinentes les analyses inter-établissements et le *benchmarking*. ConsoRes assure également une restitution rapide de leurs données de consommation et de résistances à tous les acteurs de l'établissement qu'ils aient une activité sectorisée (prescripteur) ou transversale (pharmacien, bactériologiste, etc.). L'exploitation des données par ces différents acteurs à l'aide d'un rapport standard automatique ou d'un rapport personnel édité en ligne est un autre point fort de l'outil.

Conclusion. – En plus de la surveillance, l'analyse des données de consommation et de résistance à l'échelon local devrait avoir un rôle pédagogique en permettant à chacun d'établir sa démarche à venir dans le cadre du bon usage des antibiotiques.

Mots clés : Consommation des antibiotiques ; Résistance bactérienne ; Outil web

1. Introduction

Two pluri-annual plans (2001–2005 and 2007–2010) have already been implemented in France to preserve the effectiveness of antibiotics. These plans have for objective to master and rationalize prescriptions; they should induce a better and lower use of antibiotics so as to prevent the emergence of resistance to antibiotics. The French Agency for the safety of Health Products (AFSSAPS) was designated in June 2008 as national organizer for antibiotic consumption monitoring within the national plan to preserve antibiotic effectiveness. This agency recently reported on antibiotic consumption [1] and described a global decrease of antibiotic consumption by 16% between 2000 and 2010. Nevertheless, it also mentioned persistent and worrying signs among which a tendency to increase of consumption since 2005. This new increase of consumption was also confirmed by Henard et al. [2] in a study made on consumption data collected by the standardized assessment of nosocomial infection prevention activity (French acronym BSLIN).

Several national databases are currently dedicated to the monitoring of antibiotic consumption:

- the AFSSAPS collects and processes antibiotic consumption data with information provided by notification of sales reports. Thus, it has reliable data provided for every antibiotic agent used by the global French population;
- the Directorate for Research, Analysis, Evaluation, and Statistics of Ministry of Health (DREES): the database on medical drug consumption is extracted from available information systems (stock software used by pharmacies) in healthcare institutions and dedicated to the consumption of all medical drugs including, antibiotics. The data is collected in the institution;
- the Raisin (Network for alert, investigation, and monitoring of nosocomial infections) – set up by a partnership among the five coordination centers for the prevention of nosocomial infections (CClin) and the National Institute for Public Health Surveillance (InVS) – has offered collection of antibiotic consumption, to volunteer institutions since 2008, using a mask adapted for national use (Raisin ATB). Data is collected for the institution in a global manner or by type of activity making comparison possible;
- finally, the global amount of antibiotics consumed by the institution is collected, for each antibiotic family, to calculate the composite index of antibiotic stewardship (French acronym: ICATB), index used for nosocomial infection surveillance.

A recent ICATB analysis proved that there was a large quantity of unusable data in this database due to collection mistakes [2]. Furthermore, because they are mostly used to observe consequences of various implemented antibiotic stewardship policies, most of these databases yield global results often with great delay before analysis and availability while presenting variations between values per institution. This data presents little interest within a single institution. If a surveillance tool is to present – besides its macroscopic indicator aspect - a pedagogic interest and an incentive for progress (to improve prescriptions), the prescriber must be able to access consumption data and with these figures have an idea of the ecological impact of his prescription. But, despite recommendations already made in the two plans to preserve the effectiveness of antibiotics, information on the relationship between antibiotic consumption and bacterial resistance is not fully documented. A collection system should thus be implemented locally "the closest possible to the prescriber" insuring transmission of antibiotic consumption and bacterial resistance for the various personnel of healthcare institutions so as to allow for a fine and quick analysis.

The Eastern CClin developed an online tool to this end, called ConsoRes, which has been tested since January 2011 in some volunteer institutions of the greater North-East of France.

2. Presentation of ConsoRes and methodology

ConsoRes is a web tool, which allows following and analyzing of antibiotic consumption and bacterial resistance in every hospital ward (HW) of a healthcare institution. It meets two requirements: the prescriber has direct access to his data and to an automated analysis system. This tool is available to all public and private healthcare institutions by simple request to the East-CClin. To sign up for ConsoRes follow the following steps: the first user of an "expert" center registers for his institution with the East-CClin. Then he validates with a single click the following registrations. Access is then authorized with personal identification and a password, from any computer, for all institution personnel, whatever their type of activity by ward (clinician in his unit) or transversal (pharmacists, bacteriologists, presidents of CLIN, antibiotherapy experts, medical drug commission). The tool allows visualizing, either online or offline, an automated report on data of the HW, the activity, or