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Original article

Healthcare workers' knowledge and perceptions of the risks associated with emerging extensively drug-resistant bacteria

Connaissances et perceptions des soignants vis-à-vis du risque lié aux bactéries hautement résistantes émergentes

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Abstract

Objective. – Guidelines have been issued in 2010 to prevent the spread of emerging extensively resistant bacteria (eXDR), but their implementation is difficult. We aimed to evaluate healthcare workers' (HCW) knowledge and their risk perception to identify barriers to the implementation of guidelines.

Methods. – Semi-structured interviews were conducted at a University Hospital, where case patients are regularly admitted. The interviews focused on HCW's knowledge, risk perception, and challenges met. The evaluation of HCW's knowledge and contagiousness and perception of severity of eXDR carriage were analyzed statistically. Risk perception and opinion about guidelines were analyzed by qualitative description.

Results. – One hundred and twenty-one HCWs were interviewed. The category of HCW, having searched for information on resistant bacteria, and having taken care of case patients were associated with better knowledge. The HCW category, age, type of unit, seniority, and having taken care of case patients were associated with risk perceptions. Qualitative analysis identified 61 themes. HCWs were extremely concerned by the spread of bacteria within the hospital. The main challenges identified were organizational and communication issues.

Conclusion. – HCWs reported a lack of knowledge and a lack of resources to implement guidelines. Strategies to improve guidelines implementation must be based on a better availability of resources, better communication, and new educational methods.

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Keywords: Multidrug-resistant bacteria; Prevention; Healthcare workers

Résumé

Objectif. – Des recommandations sont disponibles depuis 2010 pour prévenir la transmission des bactéries hautement résistantes émergentes (BHRe). L'objectif était d'évaluer les connaissances des soignants et leur perception du risque afin d'identifier les freins à l'application des mesures préconisées dans ces recommandations.

Méthodes. – Des entretiens semi-structurés ont été conduits dans un centre hospitalier universitaire régulièrement confronté à la prise en charge des patients porteurs de BHRe. L'évaluation des connaissances et la perception par les soignants de la contagiosité et de la gravité d'un portage de BHRe a été faite par analyse quantitative. L'évaluation de leurs perceptions du risque et des obstacles rencontrés à l'application des recommandations a été faite par analyse qualitative descriptive.

Résultats. – Cent vingt et un soignants ont été interviewés. La catégorie professionnelle, avoir fait des recherches personnelles sur les BHRe et avoir pris en charge des cas sont associés aux connaissances. La profession, l'âge, le type de service, l'ancienneté et avoir pris en charge des cas sont associés aux perceptions de risque de contagiosité ou de gravité. L'analyse qualitative a identifié 61 thèmes issus des entretiens. Les soignants

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ont fait ressortir une grande sensibilisation au risque de contamination par BHRé dans l'hôpital. Les principaux obstacles à l'observance identifiés sont de nature organisationnelle et communicative.

Conclusion. – Les soignants ont évoqué des manques de connaissances et de moyens pour bien appliquer les recommandations. Les stratégies pour améliorer l'application des mesures devraient reposer sur la mise à disposition de moyens suffisants, une meilleure communication et de nouvelles méthodes d'éducation.

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Mots clés : Bactéries multirésistantes ; Prévention ; Personnel soignant

1. Introduction

A surveillance and prevention program of multidrug-resistant bacteria (MDRBs) has been implemented since the 1990s because of their high incidence, the severity of associated infections, and their ability to spread easily [1,2]. The incidence of emerging extensively drug-resistant bacteria (eXDRs) in France, i.e. carbapenemase-producing Enterobacteriaceae (CPE) and glycopeptide-resistant enterococci (GRE), has substantially been rising since the mid-2000s, especially that of CPEs [3–5].

The fight against antibiotic resistance is based on the reduction of patient exposure to antibiotics and on the implementation of measures to prevent the transmission of these bacteria. Several guidelines have thus been issued on eXDRs since 2010 [1,6]. The cross-transmission of many pathogens has considerably been reduced since the promotion of basic hygiene measures. Although aligned with a highly-promoted safety behavior, hygiene measures are often not adequately implemented. Hand hygiene measures especially remains poorly implemented [6,7]. An evaluation of hygiene precautions was performed in 2014 by the Evaluation group of hospital hygiene measures (French acronym GREPHH). The authors reported high scores of objectives met in terms of implementation and compliance with hygiene precautions: 87.2% of the objectives met as part of contact precautions (CP), although this figure is lower than that of droplet and airborne precautions (92% and 90%, respectively). However, the evaluation of knowledge reported average results (around 50%) among physicians and other healthcare workers [8]. The survey conducted by the French society for hospital hygiene revealed that only 22% of participating healthcare facilities implemented all measures recommended for the prevention of eXDR cross-transmission [9].

Several questions can thus be raised as to why the compliance with recommended measures is low. One may mention for instance the risk perception, knowledge of guidelines, and organizational means and factors [10–13]. An observational study [14] revealed that CPs for methicillin-resistant *Staphylococcus aureus* (MRSA) are only applied 28% of the time. The multivariate analysis revealed that the occupational group was highly linked to compliance with precautions. A literature review [10] analyzed the risk perception of *Clostridium difficile* and MRSA. The authors identified several factors influencing this perception: the level of education and a mistrust in the various prevention methods. Another study [15] of CPEs only reported a difference of risk perception and knowledge between younger

and more senior physicians. Healthcare professionals working in a rehabilitation and long-term care ward tend to underestimate the importance of prevention measures, as highlighted by an evaluation of knowledge [16].

We performed our study at the time of an outbreak in a University Hospital frequently managing carriers of eXDRs. We tried to identify barriers to hygiene measures compliance in the management of patients at risk of carriage or carriers of eXDRs through the evaluation of knowledge and perceptions of the hospital staff.

2. Material and methods

2.1. Study population

The study was performed in 2015 at a University Hospital (1250 beds) located in the Île-de-France region. Targeted populations were senior physicians, junior physicians, executive-level nurses, registered nurses, and nursing assistants working in each hospital ward. More than 50% of the questionnaires were filled in by paramedical staff. We contacted all wards and targeted staff took part in the survey on a voluntary basis.

2.2. Questionnaire design and interviews

The questionnaire was based on behavioral socio-psychological theories, such as those of Michie et al. [17]. Social and occupational characteristics were collected. Participants were asked questions about their general knowledge of eXDRs and guidelines, and on their perceptions of the difficulties related to the implementation of guidelines. Two questions asked participants to rank eXDR carriage based on the perception of their contagiousness and severity on a scale of 1 to 5, as compared with influenza, cancer, human immunodeficiency virus (HIV), and MRSA carriage. A single investigator conducted all interviews in the various wards for two months (from February 20, 2015 to April 14, 2015). Interviews were recorded and transcribed as verbatim text. The EPI Info software was used for capturing answers to the questionnaire.

2.3. Data analysis

2.3.1. Quantitative analysis of knowledge, opinion of guidelines, and perceptions

Answers related to knowledge were quantified in a binary variable according to expected answers. Each variable had a

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