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Control of a regional outbreak of *vanA* glycopeptide-resistant *Enterococcus faecium*, Eastern France, 2004–2009

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SUMMARY

At the end of 2004, an outbreak of glycopeptide-resistant *enterococci* (GRE) spread from the Nancy Teaching Hospital to more than 40 facilities in the Lorraine region. Because this outbreak appeared to be uninhibited, a regional task force was set up to organize and co-ordinate the management of the outbreak, visiting the affected facilities to publicize the existing recommendations and take stock of the problems encountered in the field. The task force then proposed control measures specific to the region. The proposed measures included promoting the use of alcohol-based hand-rub solutions, isolation measures, enhanced screening policies, cohorting GRE-colonized patients and contacts in special wards with dedicated staff where possible, or failing that, isolating them in single rooms with additional "contact" precautions, maintaining these precautions for GRE-colonized patients until a negative stool sample was obtained after antibiotic treatment (which is a more restrictive definition of "cleared" than usually employed), regional co-ordination of the follow-up of GRE-colonized patients with the weekly publication of a list of institutions that were or had been affected to allow isolation measures to be adopted as soon as known-GRE-colonized patient were readmitted. It was not possible to determine the efficacy of each individual measure on the course of the outbreak. Nevertheless, we observed that the number of new GRE-colonized patients started to decrease following their implementation. Ultimately, 1077 GRE colonizations were recorded in Lorraine, and the outbreak is now under control.

Introduction

Enterococci, which constitute part of the normal gut flora, are not particularly pathogenic organisms but can cause urinary tract and intra-abdominal infections, bacteremia and endocarditis. Widespread use of antibiotics, including vancomycin, has promoted the emergence of glycopeptide-resistant strains (Moellering, 1998). The first strains of glycopeptide-resistant *Enterococci* (GRE) were described as early as 1987 in the United Kingdom and France and in 1990 in the United States, where they accounted for 28.5% of the enterococcal strains causing hospital-acquired infections in intensive care units (National Nosocomial Infections Surveillance System Report, 2004; Ramsey and Zilberberg, 2009). GRE infections have been reported to be responsible for increased hospitalization time and costs, as well as increased mortality. By 2007, the rate of glycopeptide resistance among *Enterococci* isolates in Europe ranged from less than 1% in Scandinavia to 25–50% in Greece, Portugal and Ireland. Currently, this rate remains below 2% in France (Werner et al., 2008), but two problems could arise if the rate were to increase:

- Although GREs mostly result in colonizations, a small proportion could cause infections, such as urinary tract infections or bacteremia. If more *Enterococcus* spp. become glycoprotein resistant, the number of GRE colonizations and infections will also increase, along with the associated morbidity and mortality.
- Because the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) remains high in French hospitals (European Antimicrobial Resistance Surveillance System, 2008), the co-existence of GRE and MRSA creates a risk of glycopeptide-resistant MRSA by transfer of the *vanA* resistance gene from GRE to MRSA, creating another therapeutic problem with a more pathogenic bacterium than GRE. This transfer has already been reported on a number of occasions (Chang et al., 2003; Tenover et al., 2004; Whitener et al., 2004).

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Table 1
Adapted guidelines for the care of GRE-colonized patients.

	GRE-colonized patients		
	Acute care facilities	Rehabilitation care facilities	Long-term care facilities
Hand washing	Alcohol-based hand-rub solutions only		
Isolation measures	Cohorting with dedicated staff, or failing that, grouping in a dedicated area, or failing that, containing in a single room with additional "contact" precautions	Rehabilitation care service cohorting with dedicated staff, or failing that grouping in a dedicated area, or failing that additional "contact" precautions	Single room with "standard" precautions, or additional "contact" precautions if close care is used or antibiotic therapy
Transfer/discharge	Not permitted to other acute care health facilities, permitted to rehabilitation care facilities, encouraged to long-term care facilities and home	Permitted	Permitted
Follow-up	Once a month until 3 consecutive negative results are obtained, then rectal swab on a case-by-case basis, particularly when antibiotic therapy is used		

In France, the first nosocomial GRE outbreaks were reported in 2005 (Leclercq and Coignard, 2006). A national meeting of experts was organized in May 2005 to assess this threat. National guidelines for GRE prevention and control were issued in 2005 and 2006 (Ministère de la Santé et des Solidarités, 2006a,b), enhanced hand hygiene, screening of contact patients, banning transfers of GRE-colonized and contact patients, and grouping or cohorting of GRE-colonized and contact patients.

Background

In Eastern France a GRE outbreak was identified in the Nancy Teaching Hospital at the end of 2004. This outbreak was related to the clonal spread of a highly vancomycin- and teicoplanin-resistant *vanA Enterococcus faecium* strain. From September 2004 to September 2005, a total of 121 GRE colonizations (determined by the presence of GRE in a rectal swab without related clinical signs) and 9 infections (determined by the presence of GRE in bacteriological diagnostic samples with at least one related clinical sign) were detected in several wards. The implemented control measures included screening, grouping GRE-colonized patients together in the same ward (but without dedicated medical and ancillary staff) and enhanced hand hygiene. These measures appeared to be effective for approximately one year. However, at the beginning of 2007, there was a resurgence of the outbreak that was even worse than before (40 new cases per month) (Rabaud et al., 2008), and the resurgent strain was identified as the same strain from the previous outbreak based on PCR and DNA strip assays (GenoType Enterococcus, Hain Lifescience GmbH, Nephren, Germany) (Eigner et al., 2005). Moreover, in 2007, GRE spread to other health care facilities in the region.

A regional GRE outbreak of this nature involving a number of health care facilities was new in France. Because it appeared particularly difficult to establish national guidelines for this scenario, regional-level management was deemed necessary. A specific regional task force was set up on the 2nd of July, 2007 to organize and co-ordinate the control of the outbreak, as had been successfully done before (Ostrowsky et al., 2001). The aim of this paper is to describe the task force-implemented measures that helped control a firmly established multi-centre outbreak within 18 months.

Methods

Task force

The regional task force included a junior medical doctor, a nurse, a senior nurse with experience in infection control and a secretary, who were all under the supervision of a senior consultant specializing in infectious diseases and infection control.

In July 2007 four meetings were held by the task force and regional health authorities, to which infection control practitioners, chairman of hospital infection control committees and anyone affected by the GRE outbreak were invited. The task force was presented, the GRE problem in Lorraine was described and the national guidelines (Ministère de la Santé et des Solidarités, 2006a,b) were recapitulated.

During July and October 2007, the following actions were taken by the task force.

Visiting all of the health care facilities involved in the outbreak

All health care facilities admitting or having previously admitted GRE-colonized-patients were visited. A staff member was

Table 2
Adapted guidelines for the care of GRE-contact patients.

	GRE-contact patients		
	Acute care facilities	Rehabilitation care facilities	Long-term care facilities
Hand washing	Alcohol-based hand-rub solutions only		
Isolation measures	Cohorting with dedicated staff, or failing that, grouping in a dedicated area, or failing that, containing in a single room with additional "contact" precautions until 3 negative weekly screens are obtained	Single room with additional "contact" precautions until 3 negative weekly screens are obtained	Single room with "standard" precautions, or additional "contact" precautions if close care is required or antibiotic therapy until 3 negative weekly screens are obtained
Transfer/discharge	Permitted if single room and additional "contact" precautions are used in the receiving facility until 3 negative weekly screens are obtained	Permitted if single room and additional "contact" precautions are used in the receiving facility until 3 negative weekly screens are obtained	Permitted in single room with "standard" precautions, or additional "contact" precautions if close care is used or antibiotic therapy until 3 negative weekly screens are obtained
Screening	Once a week for 3 consecutive weeks		