Carbapenemase-producing Bacteria in Patients Hospitalized Abroad, France

To the Editor: The emergence and rapid worldwide dissemination of carbapenemase-producing bacteria (CPB), especially carbapenemase-producing *Enterobacteriaceae* (CPE), have prompted public health authorities to reconsider prevention strategies to control the spread of these organisms (*1*–*5*). In France, national guidelines recommend systematic screening for commensal CPE and glycopeptide-resistant enterococci (GRE) in all patients admitted to hospitals who have been hospitalized in other countries during the preceding 12 months (*6,7*) (repatriated patients), independently of whether transfer was direct from hospital to hospital (DT) or not (NDT). These guidelines also recommend implementation of presumptive patient isolation and contact precautions on admission (*6,7*). We conducted a 33-month survey at Hôpital Européen Georges Pompidou (HEGP), a university teaching hospital in Paris, of CPE and GRE in repatriated patients; we also investigated incidence of extended-spectrum β-lactamase (ESBL)–producing *Enterobacteriaceae* and carbapenemase-producing *Acinetobacter baumannii* and *Pseudomonas* spp. in the same patient group.

During November 2010–July 2013, a total of 541 patients who had previously been hospitalized in a total of 71 other countries were admitted to HEGP. Rectal swab specimens were taken from 510 patients; 82 (16.1%) were DT, 415 (81.4%) were NDT, and 13 (2.5%) had an unclear history of transfer. Median patient age was 61 (range 12–98) years; 70% of patients were male. Results of screening by using antibiotic-containing Luria Bertani broths for enrichment and plating on selective media were negative for 354 (69.4%) of the 510 patients surveyed; 33 (6.5%; 16 DT, 17 NDT) patients were colonized with ≥1 CPB and/or GRE and 123 (24.1%; 22 DT, 99 NDT, 2 unclear) with ESBL producers only. More specifically, 19.5% (16/82) of DT patients and 4.1% (17/415) of NDT patients were colonized with CPB and/or GRE ($p<10^{-5}$ by χ^2 test); 26.8% (22/82) of DT patients and 23.9% (99/415) of NDT patients were colonized with ESBL producers only ($p = 0.67$). Characteristics of the 33 patients carrying CPB and/or GRE are shown in the Table. Of all isolates, 191 produced ESBLs only.

Rates of resistance for ESBL-producing *Enterobacteriaceae* and CPE were, respectively, 53.1% and 57.1% to gentamicin, 16.7% and 32.1% to amikacin, 77.1% and 82.1% to nalidixic acid, 63% and 75% to levofloxacin, and 70.3% and 75% to ciprofloxacin. The *Pseudomonas* spp. and *A. baumannii* isolates were also multidrug resistant; all isolates were colistin susceptible.

Among the 33 colonized patients, 13 (39.4%) were not infected; 1 of the uninfected patients died. Seven patients were infected with ≥1 CPB (health care–related in 2 patients, 1 of whom died), 4 patients with ESBL-producing *Enterobacteriaceae* (health care–related in 1 patient, who died), and 9 patients with other bacteria (health care–related in 4 patients, 1 of whom died). No patients were infected with GRE. Overall, 60.6% of colonized patients were infected and 12.1% died; 35% (7/20) of the infections were health care–related (3 urinary tract device–related infections, 2 cases of ventilator-associated pneumonia, 1 infection at the site of a portacath, and 1 case of cellulitis).

Almost 25% of the repatriated patients carried ESBL-producing *Enterobacteriaceae* (mostly CTX-M-15 producers; online Technical Appendix, http://wwwncd.cdc.gov/EID/article/20/7/13-1638-Techapp1.pdf); 6.7% carried CPB and/or GRE. By comparison, during the study period, only 10.8% of 2,314 systematically screened patients in the medical and general surgery intensive care units at HEGP (repatriated patients excluded) carried ESBL-producing *Enterobacteriaceae*; 1 carried *vanA Enterococcus faecium* (data not shown). For patients with no record of hospitalization abroad, no CPE isolates were found; other bacterial isolates included 1 *vanA E. faecalis*, 13 *vanA E. faecium* (all known from previous outbreaks), 4 OXA-23–producing *A. baumannii*, and 4 VIM- and 1 IMP-producing *P. aeruginosa*.

Of the repatriated patients, 19.5% of DT patients (vs. 4.1% of NDT) and 23.9% (7 DT, 4 NDT) of those who were transferred to medical and general surgery intensive care units (ICUs) were CPB and/or GRE carriers. This finding highlights the role of severe underlying disease or injury and recent antimicrobial drug treatment. Among ICU patients, 3 died, most likely from underlying conditions, findings in line with the observation that carriage of or infection with multidrug-resistant bacteria is not the only predictor of death (*8*). Most of the 28 CPE isolates were resistant to fluoroquinolones and aminoglycosides except amikacin; 21 carried OXA-48–type genes, 7 of which were non-ESBL producers and were detected only around an ertapenem disk on Drigalski agar (Bio-Rad, Marnes-la-Coquette, France). All CPB, irrespective of species, showed imipenem hydrolysis in a recently described test (*9*) that was shortened and simplified by incubating colonies directly in antibiotic solution.

Although time-consuming and certainly perfectible, implementation of strict control measures to limit CPB and GRE spread (*6,7*) seems justified, a conclusion supported by the occurrence, since November 2010, of just 1 cross-transmission–linked CPB outbreak in an ICU at HEGP (after urgent intervention for cardiac arrest). Of particular concern

Table. Clinical and laboratory data on 33 patients hospitalized in France who were previously hospitalized in other countries and were carrying carbapenemase-producing bacteria, glycopeptide-resistant enterococci, or both*

Patient no.	Year of initial hospital admission	Patient transfer status	Country of hospitalization	Species of infection	β-lactamase content		Glycopeptide resistance gene
					ESBL	Carbapenemase	
1†	2010	DT	Egypt	*E. coli*	Pos	OXA-48	
2†	2010	DT	Thailand	*A. baumannii*	Pos	OXA-23	
3†	2010	DT	Iraq	*A. baumannii*	Neg	OXA-23	
				E. faecium			*vanA*‡
4	2010	NDT	USA	*E. faecium*			*vanA*
5	2011	NDT	Morocco	*K. pneumoniae*	Neg	OXA-48	
				K. pneumoniae	Neg	OXA-48	
6†	2011	DT	Senegal	*K. pneumoniae*	Pos	OXA-48	
7	2011	DT	Congo	*E. faecium*			*vanA*‡
8†	2011	NDT	Benin	*A. baumannii*	Neg	OXA-23‡	
9	2011	NDT	Kuwait	*P. aeruginosa*	Neg	VIM-2	
10†	2011	NDT	Kuwait	*K. pneumoniae*	Neg	OXA-48	
11†	2011	NDT	Kuwait	*P. aeruginosa*	Neg	VIM-2	
12†	2011	NDT	Kuwait	*E. faecium*			*vanA*
13†	2011	DT	Libya	*K. pneumoniae*	Pos	OXA-48	
14†	2011	DT	Libya	*E. coli*	Pos	OXA-48	
				K. pneumoniae	Pos	OXA-48	
				A. baumannii	Neg	OXA-23	
				E. faecium			*vanA*
15	2011	NDT	Saudi Arabia	*E. faecium*			*vanA*
16†	2011	NDT	Pakistan	*E. faecium*			*vanA*
17	2011	NDT	Italy	*A. baumannii*	Neg	OXA-23	
				K. pneumoniae	Neg	KPC-3	
18†	2011	DT	Spain	*K. pneumoniae*	Neg	OXA-48	
19	2011	NDT	Israel	*K. pneumoniae*	Neg	KPC-3	
20†	2012	DT	Egypt	*A. baumannii*	Neg	NDM-1	
				A. baumannii	Neg	NDM-1	
				P. putida	Neg	VIM-2	
21†	2012	DT	Tunisia	*E. coli*	Pos	OXA-48	
				K. pneumoniae	Pos	OXA-48	
				K. pneumoniae	Neg	OXA-48	
22†	2012	NDT	Tunisia	*A. baumannii*	Neg	OXA-23	
23†	2012	DT	India	*E. coli*	Neg	NDM-1	
				M. morganii	Pos	NDM-1	
				P. aeruginosa	Neg	VIM-2	
24†	2012	NDT	Cambodia	*E. coli*	Neg	NDM-4‡	
				E. coli	Pos	OXA-48‡	
25†	2012	DT	Sri Lanka	*E. coli*	Pos	OXA-48‡	
				K. pneumoniae	Pos	OXA-181‡	
26	2013	NDT	Algeria	*E. coli*	Neg	OXA-48	
27†	2013	NDT	Algeria	*E. coli*	Neg	OXA-48	
28	2013	DT	Tunisia	*A. baumannii*	Neg	NDM-1	
29†	2013	DT	Libya	*K. pneumoniae*	Pos	OXA-48	
30	2013	DT	Libya	*K. pneumoniae*	Pos	OXA-48	
				K. pneumoniae	Pos	OXA-48	
31	2013	NDT	India	*E. coli*	Pos	OXA-181	
				E. coli	Neg	NDM-7‡	
				K. pneumoniae	Neg	NDM-7‡	
32	2013	NDT	Georgia	*P. aeruginosa*	Pos	VIM-2‡	
33†	2013	DT	Montenegro	*E. faecium*			*vanA*‡

*ESBL, extended-spectrum β-lactamase; DT, direct transfer from hospital abroad to HEGP; *E. coli, Echerichia coli*; Pos, positive; *A. baumannii, Acinetobacter baumannii*; Neg, negative; *E. faecium, Enterococcus faecium*; NDT, nondirect transfer (hospitalized abroad within 12 mo before transfer to HEGP); *K. pneumoniae, Klebsiella pneumoniae*; *P. aeruginosa; Pseudomonas aeruginosa*; *P. putida, Pseudomonas putida*; *M. morganii, Morganella morganii*.
†Patient carrying an ESBL producer in addition to the carbapenemase-producing bacteria and/or glycopeptide-resistant enterococci.
‡Resistance gene not reported previously in the country of initial hospitalization.

is the high proportion of OXA-48–producing isolates in persons with no documented link to repatriation in France (*10*). This finding could be explained in part by the historical and demographic relationships between France and North Africa, where prevalence of OXA-48 is high, reflected in results from patients repatriated from that part of the continent.

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Zoonotic Filariasis Caused by Novel *Brugia* sp. Nematode, United States, 2011

To the Editor: Zoonotic brugian filariasis is an incidental infection of humans with *Brugia* spp. nematodes that primarily parasitize nonhuman vertebrates, rarely humans (*1*–*3*). In contrast to classical lymphatic filariasis caused by *B. malayi* and *B. timori*, which are found in Asia, most zoonotic *Brugia* infections have been reported from the northeastern United States (*2*,*3*) or South America (*3*). We report a case of symptomatic brugian infection in a New York City resident who had not traveled to the Eastern Hemisphere.

In 2011, a 53-year-old White man first noted tenderness and swelling behind his penis and in his right groin after having fallen 3 months earlier. The tenderness was relieved by nonsteroidal antiinflammatory drugs, but the swelling continued; an oral antimicrobial drug, prescribed for presumed cellulitis, produced no improvement. At the time of examination, the patient had no fever or other signs or symptoms. Only a 3.0-cm × 3.0-cm firm, nonfixed right inguinal nodule without warmth or tenderness was noted. Laboratory findings were remarkable for total leukocytes of 6.4×10^9, eosinophilia (12%, 600 cells/mm^3), decreased hemoglobin level (10.0 g/dL), and low hematocrit of 31.2%. An excisional biopsy sample revealed intralymphatic adult nematodes with viable-appearing microfilaria (online Technical Appendix Figure, wwwnc.cdc.gov/EID/article/20/7/13-1654-Techapp1.pdf).

The patient had been born and raised in Champlain, Illinois, and had resided in the Bronx, New York, since 1979; he had no history of travel to filariasis-endemic regions. Characteristics of the adult worms and microfilaria were most consistent with those of *Brugia* spp., which was surprising because classical brugian lymphatic filariasis seems to be limited to Asia (*B. malayi*) and Indonesia (*B. timori*) (*4*,*5*). However, the adult filariae were smaller than expected for *B. malayi* or *B. timori* nematodes, prompting consideration of zoonotic filariasis (*1*,*6*). The adult worms and microfilaria seemed to be viable, although zoonotic *Brugia* spp. in histologic