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ePoster Viewing

Antimicrobials: resistance surveillance

Airport door handles and the global spread of antimicrobial resistant bacteria

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Objectives

Airports are places where people from different parts of the world get directly or indirectly in contact. Therefore, major hubs could be drivers for the global spread of antimicrobial resistant pathogens. The objective of this study was to investigate the bacterial contamination of door handles in airport toilets to assess the risk of frequently touched surfaces for the spread of bacterial pathogens.

Methods

In a longitudinal study, door handles of lockable toilet cabins in airports around the world were swabbed with moistened cotton swabs (3M Quick Swab, Forrest City, Iowa, USA). Both directly and after enrichment in non-selective BHI broth, swabs were streaked on Columbia blood agar, McConkey agar, and selective media for the detection of *Staphylococcus aureus*, extended-spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae* and vancomycin-resistant enterococci (VRE). All colonies indicative of *S. aureus*, ESBL-producing *Enterobacteriaceae*, *Stenotrophomonas maltophilia*, *Acinetobacter baumannii* and VRE were subjected to species identification using MALDI-tof (Bruker, Bremen, Germany) and susceptibility testing using Vitek2 automated systems (bioMérieux) with EUCAST clinical breakpoints. *S. aureus* isolates were *spa* sequence-typed and tested for presence of *lukS-PV/lukF-PV* (Panton-Valentine leucocidin, PVL). The ESBL phenotype in ESBL-producing *Enterobacteriaceae* was confirmed by the double disc diffusion test. The beta-lactamase encoding genes *bla*_{TEM}, *bla*_{SHV} and *bla*_{CTX-M} were detected by mPCR.

Results

In total, 249 swabs were analysed from 96 airports in 47 countries between December 2012 and October 2014. Overall, 12.1% (n=30) of the door handles were contaminated with the considered bacteria. Contamination rates were highest for *S. aureus* (6.0%, n=15), followed by *S. maltophilia* (2.4%, n=6) and *A. baumannii* complex (2.0%, n=5). One methicillin-resistant *S. aureus* (*mecA* positive, *spa* type t1451) was detected in Paris. All *S. aureus* isolates were PVL negative. All *S. aureus* belonged to different *spa* types (t008, t015, t056, t084, t148, t164, t174, t648, t706, t1309, t1459, t2616, t3165, t9207). ESBL-producing *Enterobacteriaceae* (3 *Citrobacter* sp., 1 *Enterobacter cloacae*) were detected in New York, Frankfurt a. M. and Vienna. The *C. freundii* isolate harboured *bla*_{TEM}, the other ESBL-producing *Enterobacteriaceae* were negative for *bla*_{TEM}, *bla*_{SHV} and *bla*_{CTX-M}. VRE, carbapenem resistant *Enterobacteriaceae* or carbapenem resistant *A. baumannii* were not detected.

Conclusion

Door handles of toilet cabins in airports are contaminated with bacterial pathogens from the skin and intestinal microbiota, but the proportion of multidrug resistant bacteria seems to be rather low.