genic role of KIPyV and WUPyV in immunocompromised patients.

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Extreme Drug Resistance in Acinetobacter baumannii Infections in Intensive Care Units, South Korea

To the Editor: Acinetobacter spp. have emerged as a cause of nosocomial infections, especially in intensive care units (ICUs). In South Korea, Acinetobacter spp. was ranked as the third most frequently found pathogen in ICUs (1). With the emergence of multidrug-resistant (MDR) or pandrug-resistant (PDR) isolates, few drugs are now available to treat MDR or PDR Acinetobacter infections; polymyxins are the only therapeutic option in many cases (2). Current polymyxin resistance rates among Acinetobacter isolates are low worldwide (3). We report the emergence of extreme drug resistance (XDR) in A. baumannii isolates from patients in ICUs of Samsung Medical Center in Seoul, South Korea. These isolates were resistant to all tested antimicrobial drugs, including polymyxin B and colistin, to which PDR isolates are normally susceptible.

Sixty-three nonduplicate Acinetobacter spp. isolates were collected from the ICUs from April through November 2007. Species identification was performed based on partial RNA polymerase β-subunit gene sequences, amplified rDNA restriction analysis, and the gyrase B gene–based multiplex PCR method (3). Forty-four isolates were identified as A. baumannii: 9 as genomic species 3, six as genomic species 13TU, 2 as A. baumannii–like species, and 1 each as A. junnii and genomic species 10.

In vitro susceptibility testing was performed and interpreted by using the broth microdilution method according to the Clinical and Laboratory Standards Institute guidelines (4). Colistin and polymyxin B resistances were defined as MIC >4 mg/L (4). MDR was defined as characterized by resistance to ≥3 classes of antimicrobial drugs, and PDR was defined as characterized by resistance to all antimicrobial drugs, regardless of colistin and polymyxin B susceptibility. XDR was defined as resistance to all antimicrobial drugs. Multilocus sequence typing (MLST) and pulsed-field gel electrophoresis (PFGE) were performed for all PDR isolates according to previously described methods (5,6). Genes encoding oxacillinases, such as those classified as OXA-23-like, OXA-24/40-like, OXA-51-like, and OXA-58-like, were detected as previously described (7). PCR and sequence analyses were performed to detect and characterize the other antimicrobial resistance genes, according to methods reported (8).
Of 63 Acinetobacter isolates, 31.7% and 34.9% were resistant to imipenem and meropenem, respectively. Of the 63 isolates, 27.0% and 30.2% were resistant to polymyxin B and colistin, respectively. For the other antimicrobial drugs tested in this study and resistance to tigecycline (MICs 4 mg/L). Thus, they were resistant to all antimicrobial agents available, including colistin, polymyxin B, and tigecycline. XDR poses serious problems in the treatment of patients with Acinetobacter infections, especially given the slow development of new antimicrobial agents.

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Table. Clinical characteristics of 8 patients infected with extremely drug-resistant Acinetobacter baumannii isolates, South Korea*

| Strain no. | Patient age/sex | Underlying disease | Infection† | Days before isolation | Concurrent bacteremia | 30-d outcome | Infection-related death |
|------------|-----------------|--------------------|------------|----------------------|-----------------------|--------------|------------------------|
| 07AC–052   | 60 y/F          | Acute myeloid leukemia | Pneumonia  | 15/8                 | No                    | Died         | Yes                    |
| 07AC–159   | 79 y/M          | Lymphoma           | Pneumonia  | 35/9                 | No                    | Died         | No                     |
| 07AC–192   | 50 y/M          | Status postiver transplantation | Pneumonia  | 256/2                | Yes                   | Survived     | NA                     |
| 07AC–204   | 55 y/F          | Steven-Johnson syndrome | Pneumonia  | 13/13                | Yes                   | Survived     | NA                     |
| 07AC–336   | 16 mo/M         | Medulloblastoma     | Pneumonia  | 32/13                | Yes                   | Died         | Yes                    |
| 07AC–347   | 17 mo/M         | Hepatoblastoma      | Pneumonia  | 135/28               | No                    | Died         | Yes                    |
| 07AC–329   | 1 mo/F          | Edward syndrome     | Colonization‡ | 33/33               | NA                    | NA           | NA                     |
| 07AC–063   | 56 y/M          | Lung cancer         | Colonization‡ | 26/21               | NA                    | NA           | NA                     |

*ICU, intensive care unit; NA, not applicable. All but 1 patient (with strain 07AC–192) had mechanical ventilators. Four patients (with strains 07AC–159, 07AC–192, 07AC–336, and 07AC–063) were immunocompromised hosts who had daily administration of corticosteroid (>20 mg/d of prednisolone or an equivalent drug) during >2 wk and treatment with chemotherapy for an underlying malignancy during 1 month before hospital admission.
†Infection is defined as invasion of the body tissues by microorganisms resulting in disease.
‡Colonization occurs when an agent’s presence in a host does not cause a specific immune response or infection.
To the Editor: The idea that populations provide data on their influenza status through information-seeking behavior on the Web has been explored in the United States in recent years (1,2). Two reports showed that queries to the Internet search engines Yahoo and Google could be informative for influenza surveillance (2,3). Ginsberg et al. scanned the Google database and found that the sum of the results of 45 queries that most correlated with influenza incidences provided the best predictor of influenza trends (3). On the basis of trends of Google queries, these authors put their results into practice by creating a Web page dedicated to influenza surveillance. However, they did not develop the same approach for other diseases.

To date, no studies have been published about the relationship of search engine query data with other diseases or in languages other than English.

We compared search trends based on a list of Google queries related to 3 infectious diseases (influenza-like illness, gastroenteritis, and chickenpox) with clinical surveillance data from the French Sentinel Network (4). Queries were constructed through team brainstorming. Each participant listed queries likely to be used for searching information about these diseases on the Web. The query time series from January 2004 through February 2009 for France were downloaded from Google Insights for Search, 1 of the 2 websites with Google Trends that enables downloading search trends from the Google database (5). Correlations with weekly incidence rates (no. cases/100,000 inhabitants) of the 3 diseases provided by the Sentinel Network were calculated for different lag periods (Pearson coefficient ρ).

The highest correlation with influenza-like illness was obtained with the query grippe –aviaire –vaccin, the French words for influenza, avian, and vaccine respectively (ρ = 0.82, p<0.001). The minus sign removed queries that contained the terms avian or vaccine. Use of the query word grippe alone resulted in a lower correlation (ρ = 0.34, p<0.001). The high double peak in 2005–2006 and the smaller peaks preceding annual epidemics observed with the query word grippe alone were decreased by this specification. However, the unusual double-peak shape of the 2005–2006 epidemic remained (online Appendix Figure, panel A, available from www.cdc.gov/EID/content/15/8/1327-appF.htm).

The highest correlation with acute diarrhea was obtained when we searched for the French word for gastroenteritis (ρ = 0.90, p<0.001). Various spellings were used to account for the presence/absence of an accent or a hyphen. The Google database was searched for gastro-enterite + gastro-entérite + gastroenterite + (gastro enterite) + (gastro entérite). The + sign coded for or, enabling searches for queries containing ≥1 of the terms. The second highest correlation was obtained when the keyword gastro (ρ = 0.88, p<0.001) (online Appendix Figure, panel B) was used. The highest correlation with chickenpox was obtained with the French word for chickenpox (varicelle) (ρ = 0.78, p<0.001) (online Appendix Figure, panel C).

A time lag of 0 weeks gave the highest correlations between the best

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