Risk-adjusted surveillance data can help guide facilities and states to compare their VRE infection rates and determine whether these factors are independently associated with VRE. Larger number of beds and ICU beds, longer average length of stay and the presence of an infection control program were found to be risk factors for acquisition of VRE. Our evaluation showed in a period of 10 years that VRE expressing Enterococcus faecalis and E. faecium, increasing acquired resistance to glycopeptides and β-lactams has done the movement more challenging. We aimed to describe the risk factors for acquisition of bacteremia for vancomycin-resistant E. faecium (VRE) and ampicillin-resistant E. faecalis (ARE) and the 30-day mortality in comparison to susceptible enterococcal bloodstream infection (BSI).

Methods. From 2007 to 2017 medical records of all BSIs for E. faecalis and E. faecium were evaluated. Risk factor for acquisition of VRE and ARE as well as the significant variables associated with 30-day mortality for enterococcal BSI were determined by univariate and multivariate analysis. The molecular mechanism of VRE was performed by PCR.

Results. There were 192 patients with E. faecalis BSI of which 107 (56%) patients had VRE BSI with 94% VRE strains belonging to vanA gene. The index bacteremic episodes were classified as nosocomial or healthcare associated in 99%, 102% (95%) had hospitalization 1 year before and 101 (94%) history of use of antibiotics 3 months earlier, the multivariate analyses were conducted as duration of hospitalization >10 days (OR, 8.0; 95% CI, 1.1–58.2), use of central venous catheter (OR, 11.15; 95% CI, 2.48–50.2) and enteralchael cannula (OR, 17.91; 95% CI, 1.22–262) as significant associated variables. The mortality for VRE was greater than susceptible E. faecium (60%) vs. 30% (P < 0.001). The only factors for 30-day mortality for E. faecium in the multivariate analysis was APACHE II score (OR,1.45; 95% CI, 1.26–1.66) and duration of the previous hospitalization >10 days (OR, 0.52). No specific risk factors were associated with 30-day readmission. 4% of patients with previous nosocomial exposure, severely ill patients and cancer patients on chemotherapy during the bacteremic episode were the variables associated with 30-day mortality. ARE is yet of low prevalence and less known, constant surveillance about it is warranted.

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Background. Bacterial resistance in China had been increasing in prevalence. Vancomycin-resistant enterococci (VRE) different from other bacteria had lower isolated rate and apparent regional variations. In this study, we identified the characteristics of VRE infections in Chinese patients based on the China Antimicrobial Surveillance Network (CHINET) in 2016.

Methods. This case–control study was conducted in 97 VRE patients and 95 Vancomycin-susceptible Enterococcus (VSE) patients from 20 medical centers. Demographics, disease characteristics, therapeutic measure, as well as laboratory data were obtained from medical records for analysis. Descriptive statistics, simple and multivariable logistic regression were performed to explore the risk factors of VRE infection.

Results. The mean age of patients in the case and control groups was 75.0 years and 65.0 years, respectively. In the case group, 52 patients developed urinary tract infections, accounting for 53.6%, followed by bloodstream infections (19.6%) and abdominal infections (5.2%). And the cases of Enterococcus faecium, Enterococcus faecalis and other enterococci infections were 70 (72.2%), 7 (7.2%), and 20 (20.6%), respectively. Moreover, the proportion of vancomycin usage before infection was 20.6%. The result of resistance analysis showed VRE patients’ other drug resistance rate was higher than VSE ones. Compared with VSE patients, VRE patients had received more urinary intubation, indwelling venous catheter, and dialysis. Additionally, the proportions of combination with stroke (8.3% vs. 2.1%), multiple organ failure (8.3% vs. 3.2%), and other infection (59.8% vs. 40.0%) were higher in the case group. What’s more, 44 (45.4%) VRE patients had been treated in intensive care unit, while 21 (22.1%) cases in the control group. Multivariable logistic regression showed that receiving indwelling venous catheter was independent risk factor for VRE infection (OR=3.342, 95% CI: 1.379–8.099). For prognosis, VRE patients had a lower effective rate (67.4% vs. 83.7%), higher hospital expense ($94991 vs. $38248), and longer hospital stay (26.0 days vs. 21.0 days).

Conclusion. Indwelling venous catheter may increase the VRE infection risk and Linezolid or Fosfomycin could still be used for infection treatment in VRE patients.

Table 1. Comparison of demographic and other characteristics between VRE and VSE patients

| Characteristics          | VRE patients (n=95) | VSE patients (n=95) | P value |
|--------------------------|---------------------|---------------------|---------|
| Age, years               | 64 (48.6%)          | 70 (62.6%)          | 0.0442  |
| Male                     | 48 (50.5%)          | 47 (50.0%)          | 0.9768  |
| Place before infection   |                     |                     |         |
| Hospital                 | 42 (44.2%)          | 51 (54.7%)          |         |
| Community                | 46 (51.6%)          | 36 (40.4%)          |         |
| Transfer of external hospital | 1 (1.1%)       | 2 (2.1%)            |         |
| Diabetes                 | 13 (13.7%)          | 22 (23.7%)          | 0.1065  |
| Tumor                    | 24 (25.3%)          | 17 (17.5%)          | 0.1909  |
| Cardiovascular disease   | 12 (12.6%)          | 22 (23.7%)          | 0.0602  |
| Carcinoïdic disease      | 9 (9.5%)            | 23 (25.3%)          | 0.0001  |
| Cardiac insufficiency     | 5 (5.3%)            | 10 (10.3%)          | 0.2824  |
| Hepatic insufficiency     | 0                   | 2 (2.1%)            |         |
| Liver cirrhosis           | 0                   | 0                   | 0.9997  |
| Renal insufficiency       | 0 (0.8%)            | 13 (14.3%)          | 0.0269  |
| GFR                       | 2 (2.1%)            | 5 (5.2%)            | 0.4446  |
| Vascula perforation       | 0                   | 2 (2.1%)            | 0.4974  |
| Immune disease            | 1 (1.1%)            | 2 (2.1%)            | >0.9997 |
| Gastrointestinal bleeding | 0                   | 2 (2.1%)            | 0.5672  |
| Severe-acute pancreatitis | 1 (1.1%)            | 1 (1.0%)            | >0.9997 |
| After the pacemaker implantation | 1 (1.1%) | 0                   | 0.4984  |
| Intestinal fistula        | 2 (2.1%)            | 0                   | 0.2345  |
| Urinary intubation        | 32 (33.6%)          | 38 (40.0%)          | 0.4293  |
| Indwelling venous catheter| 9 (9.5%)            | 31 (22.6%)          | 0.0001  |
| Mechanical ventilation    | 17 (17.9%)          | 7 (12.1%)           | 0.0018  |
| Dyspnea                   | 0 (0.5%)            | 6 (6.3%)            | 0.0667  |
| Diarrhea                  | 12 (12.6%)          | 10 (10.3%)          | 0.6135  |
| Urinary drainage          | 12 (12.6%)          | 5 (5.2%)            | 0.0692  |
| Venous drainage           | 0                   | 0                   | 0.0094  |
| Organ transplantation     | 2 (2.1%)            | 1 (1.0%)            | 0.6919  |

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