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In vitro activity of fidaxomicin and other antibiotics against Clostridium difficile isolates from a university teaching hospital in China

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Background: Clostridium difficile infection is an underestimated problem in China due to limited laboratory capacity and low awareness. Only a few studies were performed to study the molecular epidemiology, antimicrobial susceptibility, drug resistance et al. As the leading hospital in China, we retrospectively collected 101 C. difficile isolates in our hospital.

Material/methods: All the isolates were analysed for the toxin genes by multiplex PCR. The toxin gene positive strains were also typed by multilocus sequence typing (MLST). The MICs of the isolates were determined against fidaxomicin, metronidazole, vancomycin, tigecycline and moxifloxacin by the agar dilution method. The fluoroquinolone resistance genes (gyrA and gyrB) were detected in toxin gene positive and moxifloxacin resistant isolates.

Results: All the 101 isolates were sensitive to fidaxomicin (0.032-1 mg/L), metronidazole (0.125-1 mg/L), vancomycin (0.25-2 mg/L) and tigecycline (0.016-0.5 mg/L). Tigecycline

showed the lowest geometric mean MIC value 0.041mg/L, followed by fidaxomicin (0.227 mg/L), metronidazole (0.345 mg/L) and vancomycin (0.579 mg/L). 35 strains (34.7%) were resistant to moxifloxacin, and the drug resistance rate of moxifloxacin against the A-B+CDT- isolates (85.0%) was much higher than that of A+B+CDT- (15.7%) and A-B-CDT- (29.2%) isolates (P<0.001). The MIC values of fidaxomicin, metronidazole, vancomycin and moxifloxacin against the 3 ST1 isolates were higher than other STs. All the 28 toxin gene positive and moxifloxacin-resistant isolates carried a mutation either in *gyrA* or/and *gyrB*.

Conclusions: Fidaxomicin is fully active against all *C. difficile* isolates tested, which shows promise as a new drug for treating Chinese CDI patients. We consider our manuscript a highlight of the importance of raising public awareness and providing foundation for clinical treatment of CDI.