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Rapid Susceptibility Profiling of *Aeromonas dhakensis* Using a Microscan: a high Prevalence of Carbapenem-Resistance in Clinical Strains

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1. Introduction

Aeromonads are ubiquitous in aquatic environments. *Aeromonas dhakensis* is recognised as a virulent species causing gastroenteritis, severe skin and soft tissue infection and bacteremia in humans [1]. Their pathogenic nature poses public health concerns especially with the rising of antimicrobial resistance (AMR). This study aimed to carry out antimicrobial susceptibility testing (AST) for *A. dhakensis* isolated from clinical and environmental sources [2,3,4,5,6].

2. Methods

A total of 118 *A. dhakensis* (clinical=95, water environments=19, food fish=4) were interpreted of AST for 17 antimicrobial agents using Microscan NM44 plates (Beckman Coulter, CA, USA), according to CLSI guideline M45-A3 2015 [7]. We further compared the susceptibility categorisation agreement of 6 antimicrobial agents available in EUCAST 2020 [8] and CLSI 2015 [7] to determine whether adoption of EUCAST would affect the susceptibility categorisation.

3. Results and Discussion

Based on the CLSI 2015, AMR patterns observed were imipenem (77.1%), doripenem (62.7%), meropenem (41.5%), trimethoprim/sulfamethoxazole (11%), cefotaxime (8.5%) and aztreonam (0.8%). Resistance rate to carbapenems in clinical strains was at least 2.5-fold higher than that of non-clinical (environmental and food fish) strains (doripenem: 71.6% vs 26.1%; imipenem: 87.4% vs 34.8%; meropenem: 48.4% vs 13%), suggesting that clinical empirical carbapenem therapy, should be used with caution before supporting antimicrobial susceptibility testing data are available. Application of the EUCAST 2020 increased the number of resistant isolates when compared to CLSI 2015 for ceftazidime (8.5% vs 5.9%), aztreonam (1.7% vs 0.8%) and ciprofloxacin (11% vs 0%).

4. Conclusion

This study revealed a high prevalence of carbapenem-resistance in *A. dhakensis* clinical isolates. Albeit the current relatively lower prevalence in environmental and aquaculture samples, constant monitoring of AMR *Aeromonas* is necessary for environment and food safety management.

Harmonisation of MIC breakpoints for *Aeromonas* is needed for guiding therapy and surveillance for laboratories considering switching between CLSI and EUCAST.

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