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Antibiotic Resistance Profile of *Aeromonas hydrophila* and *Aeromonas caviae* Isolated from Clinical and Environment †

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1. Introduction

Aeromonads are ubiquitous in aquatic environments and the genus consists of 36 species. *Aeromonas hydrophila and A. caviae* are commonly involved in causing human infections such as gastroenteritis, severe skin and soft tissue infection and bacteremia [1]. Increasing usage of antimicrobial in humans, food fish and ornamental aquaculture can lead to antimicrobial resistance. In this study, we investigated the antimicrobial resistance patterns of *A. hydrophila* and *A. caviae* from clinical [2,3] and non-clinical sources [4–6] based on MICs using the dehydrated microdilution panel.

2. Methods

Thirty-six *A. hydrophila* (clinical = 26, aquatic environments = 10) and 70 *A. caviae* (clinical = 40, aquatic environments = 13, food fish = 17) were subjected to antimicrobial susceptibility testing with 18 antimicrobial agents (Microscan NM44 plates). The plates were incubated at 35 °C overnight and MIC values were determined according to CLSI [7].

3. Results and Discussion

Aeromonas hydrophila and *A. caviae* were resistant to eight antimicrobial agents (imipenem, meropenem, doripenem, trimethoprim-sulfamethoxazole, cefotaxime, ceftazidime, aztreonam and cefepime) ranging from 2.5% to 76.9%. *A. hydrophila* clinical strains were resistant at higher than that of water environmental strains towards imipenem (76.9% vs. 70%) and meropenem (19.2% vs. 10%) but in the opposite direction for doripenem (30.8% vs. 50%). In contrast, *A. caviae* environmental strains primarily recovered from tank water of ornamental fish exhibited a higher resistance rate compared to clinical strains for imipenem (16.7% vs. 10%), doripenem (16.7% vs. 7.5%) and meropenem (16.7% vs. 5%). Among imipenem resistant strains of both species, 83.3% (30/36) strains showed resistance with a MIC $\geq$ 8 μg/mL which is two times above the CLSI breakpoint ($\geq$4 μg/mL). Overall, 2.8% of multidrug-resistant strains were observed in three *A. hydrophila* (urine, tissue and peritoneal fluid) and one *A. caviae* (stool).

4. Conclusions

Our findings highlight that imipenem should be used with caution when treating human *Aeromonas* infection, the aquatic environment and ornamental fish.

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Conflicts of Interest:

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