

MOLECULAR EPIDEMIOLOGY OF *SERRATIA MARCESCENS* BACTERMIC ISOLATES PRODUCING AN EXTENDED-SPECTRUM β -LACTAMASE OR A NOVEL NATURAL CEPHALOSPORINASE (S4) IN SOUTHERN TAIWAN

Wen-Liang Yu¹, Yin-Ching Chuang², and Wen-Chien Ko³

Departments of ¹Intensive Care Medicine and ²Medicine, Chi-Mei Medical Center, Tainan;

³Department of Medicine, National Cheng-Kung University Medical College, Tainan, Taiwan

BACKGROUND/AIMS: *Serratia marcescens* is a gram-negative pathogen of nosocomial infections. Resistance to extended-spectrum β -lactams is usually mediated by a hyperproduced AmpC cephalosporinase or an extended-spectrum β -lactamase (ESBL), particularly CTX-M-3 in central Taiwan. We aimed to investigate the detailed ESBL and AmpC epidemiology of bacteremic *S. marcescens* isolated from one medical center in southern Taiwan.

METHODS: From August 1999 through July 2003, 69 non-repetitive isolates were investigated. ESBL- and AmpC-related genes including TEM, SHV, CTX-M and SRT families were performed by polymerase chain reaction. Genotype was analyzed by pulsed-field gel electrophoresis (PFGE).

RESULTS: ESBL production occurred in 11 (15.9%) isolates, including CTX-M-3 ($n=10$) and SHV-12 ($n=1$). All the remaining 58 isolates produced an AmpC, including a novel cephalosporinase (designated S4, $n=50$), SRT-2 ($n=3$), SST-1 ($n=1$), S4-like ($n=2$), AF384203-like ($n=1$) and AY538705-like ($n=1$) cephalosporinases. Isolates with S4 or CTX-M-3 may exhibit a similar phenotype of cefotaxime resistance but were susceptible to ceftazidime. ESBL-producers demonstrated diverse genotypes, whereas 47 (94%) of the 50 S4-producers belonged to 3 epidemic clones, including type A ($n=28$), type B ($n=17$), and type C ($n=2$). Strains with subtypes A₁ and B₃ have unexpectedly existed for 3 and 2 years in the surgical intensive care units and oncology wards, respectively.

DISCUSSION/CONCLUSIONS: Cefotaxime resistance of our bacteremic *S. marcescens* population is mainly conferred by CTX-M-3 or AmpC (S4). The novel S4-producing strains with prolonged dissemination are first reported. Continuous active surveillance cultures with molecular analysis may assist in detecting the unnoticed epidemic clones.

Keyword: *Serratia marcescens*, CTX-M-3, AmpC cephalosporinase