

MONO SULFAMETHOXAZOLE / TRIMETHOPRIM AND VANCOMYCIN COMBINATION ANTIMICROBIAL ACTIVITY AGAINST METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS*

Wichai Santimaleeworagun^{1,2}, Tossawan Jitwasinkul^{2,3},
Praewdow Preechachuwong⁴ and Wandee Samret⁵

¹Department of Pharmacy, ²Antibiotic Renaissance Project and Antibiotic Optimization and Patient Care Project by Pharmaceutical Initiative for Resistant Bacteria and Infectious Diseases Working Group, ³Department of Biopharmacy, Faculty of Pharmacy, Silpakorn University, Nakhon Pathom; ⁴Microbiology Unit, ⁵Pharmacy Unit, Hua Hin Hospital, Prachuab Khiri Khan, Thailand

Abstract. Activity of trimethoprim/sulfamethoxazole (SXT) alone or in combination with vancomycin (VAN) was evaluated against methicillin-resistant *Staphylococcus aureus* (MRSA) from 26 clinical isolates from patients admitted to Hua Hin Hospital, Prachuab Khiri Khan Province, Thailand between January 2015 and December 2016. Antimicrobial susceptibility of SXT and VAN was determined using an E-test and of SXT-VAN combination by E-test and an checkerboard (isobologram) method. Clonal relationship among MRSA strains ($n = 16$) based on *spa* typing showed the existence of three types: spat045 (75%), spat439 (19%) and spat13880 (6%). All MRSA isolates were susceptible to VAN; STX MIC₅₀ (minimum inhibitory concentration required to inhibit the growth of 50% of organisms), MIC90 and MIC range was 0.047, 0.064 and 0.032- \geq 32 μ g/ml, respectively with one strain being resistant. STX-VAN combination demonstrated additive or indifferent effect against the majority of the isolates, except synergism (by checkerboard method) in two isolates. Pharmacodynamics of STX bactericidal activity against six representative strains exhibited concentration (up to 8-16X MIC) and time (over 24 hours) dependency. Thus, SXT-VAN combination provided a possible regimen against MRSA but its efficacy in clinical use has to be evaluated.

Keywords: *Staphylococcus aureus*, isobologram, MRSA, sulfamethoxazole / trimethoprim, vancomycin

Correspondence: Wichai Santimaleeworagun,
Department of Pharmacy, Faculty of Pharmacy,
Silpakorn University, Nakhon Phathom 73000,
Thailand.

Tel: +66 (0) 3425 5800; Fax: +66 (0) 3425 5801

E-mail: swichai1234@gmail.com