3736971 SIMI/M : MAJOR:MICROBIOLOGY: M.Sc. (MICROBIOLOGY)
KEY WORDS : STAPHYLOCOCCI / TRANSPOSON / *mecA*
CHAISIT NIYASOM : Tn*4001*/Tn*4001*-LIKE ELEMENT AND TRANSPOSON-LIKE STRUCTURE Tn*4003* IN METHICILLIN-RESISTANT AND METHICILLIN-SENSITIVE STAPHYLOCOCCI ISOLATED FROM PATIENTS IN SIRIRAJ HOSPITAL. THESIS ADVISOR : AMORNRUT LEELAPORN, Ph.D., VANCHIT GHERUNPONG, M.D., NALINEE ASWAPOKEE, M.D., D.T.M & H., M.M.Sc., 114 p. ISBN 974-661-882-2

Staphylococci, especially methicillin-resistant strains, are among the most important bacterial pathogens. Methicillin-resistant staphylococci are usually resistant to a wide variety of antimicrobial agents. Many of these resistances are encoded by genes on transposons. In this study, the correlations (i) between the presence of Tn*4001*/Tn*4001*-like element and aminoglycoside resistance and (ii) between the presence of transposon-like structure Tn*4003* and trimethoprim resistance were investigated in methicillin-resistant and methicillin-sensitive clinical staphylococcal isolates. These strains included 203 isolates of *Staphylococcus aureus* and 211 isolates of coagulase-negative staphylococci (CNS). Methicillin-resistant isolates were determined by the presence of *mecA* detected by PCR. Results revealed that 100 isolates of *S. aureus* and 107 isolates of CNS were judged to be resistant to methicillin. Moreover, results obtained by *mecA* PCR were compared with those determined by 3 different phenotypic methods: oxacillin agar screen, disk diffusion and broth microdilution. All tests gave similar results to those of *mecA* PCR except for broth microdilution method tested with CNS (positive and negative predictive values, 100 and 90.43, respectively).

High degree of correlation between the presence of Tn*4001*/Tn*4001*-like element and aminoglycoside resistance in the staphylococci studied was observed. All strains harbouring the transposon were resistant to all 3 aminoglycosides; gentamicin, tobramycin and kanamycin, with the exception of 3 MRCNS that were resistant to only kanamycin or gentamicin and kanamycin. Furthermore, the transposon structure was found in methicillin-resistant staphylococci (99 and 94.39% in methicillin-resistant *S. aureus*; MRSA and methicillin-resistant CNS; MRCNS, respectively) more than in methicillin-sensitive isolates (1% in both MSSA and MSCNS). The results indicate that Tn*4001*/Tn*4001*-like element may play an important role in the dissemination of aminoglycoside resistance among staphylococci isolated from patients in Siriraj Hospital.

The study on prevalence of trimethoprim resistance among staphylococci using agar-incorporation breakpoint test (50 μg/ml of trimethoprim) revealed that 40%, 3.9%, 60.7% and 16.3% in MRSA, MSSA, MRCNS and MSCNS, respectively exhibited trimethoprim resistance. The examination for the presence of transposon-like structure Tn*4003* in these resistant strains using PCR technique showed that only 2.5%, 0%, 18.5% and 23.5% of Tp-resistant isolates of MRSA, MSSA, MRCNS and MSCNS, respectively, harboured the transposon-like structure. These data suggest that genetic elements other than transposon-like structure Tn*4003* are responsible for Tp resistance in these staphylococci.