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Community-associated Staphylococcus aureus (CA-MRSA) is associated with low level resistance against oxacillin, cefoxitin, and vancomycin.

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Background: *Staphylococcus aureus*, especially MRSA, is a leading pathogen responsible for community- and hospital-associated infections with increasing resistance to existing antibiotics. *mecA*+ MRSA with oxacillin and cefoxitin susceptibility phenotypes has been reported in Taiwan and elsewhere, but its clinical impact is not clear. We aim at delineating the molecular distribution and prevalence of low level resistance to oxacillin and cefoxitin, and vancomycin susceptibility pattern among clinicical *S. aureus* isolates.

Material/methods: *S. aureus* was isolated from clinical specimens and identified by morphologic and biochemistry standards from July, 2013 to June, 2014 from a mecical center in central Taiwan. MRSA was confirmed with *mecA* gene existence by polymerase chain reaction (PCR). The minimal inhibitory concentration (MIC) of isolates against oxacillin, cefoxitin, and vancomycin (VA) was determined with agar dilution. The staphylococcal cassette chromosome *mec* (SCC*mec*) types were determinated by multiplex PCR.

Results: Totally 427 non-duplicate *S. aureus* were collected, most were isolated from pus (233, 54.6%), sputum (139, 32.6%), and urine (32, 7.5%), and the other 23 (5.4%) were from different body sites. There were 188 (44%) methicillin-susceptible *S. aureus* (MSSA) and 239 (56%) MRSA identified. Five SCC*mec* types, including II (14, 5.8%), III (85, 35.6%), IV (77, 32.2%), V (17, 7.1%), and V_T (46, 19.2%), were discovered. Extremely high sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were noted for oxacillin (98.7%/99.5%/99.6%/98.4%) and cefoxitin (95.8%/99.5%/99.6%/94.9%), respectively. The mean VA MIC for all *S. aureus*, MSSA, and MRSA were 1.06 ± 0.45, 1.02 ± 0.41, and 1.09 ± 0.48 mg/L, respectively (p = 0.08). The mean VA MIC of molecularly healthcare-associated MRSA (HA-MRSA, SCC*mec* II and III) was higher than community-associated MRSA (CA-MRSA, SCC*mec* IV, V, and V_T) (1.25 ± 0.54 vs. 0.98 ± 0.39 mg/L, p < 0.001), and the difference was significant between SCC*mec* III (1.26 ± 0.54 mg/L) and SCC*mec* IV (0.98 ± 0.39 mg/L) and SCC*mec* V_T (0.97 ± 0.40 mg/L) (p = 0.001 and 0.003, respectively). Ten isolates (2.3%) with phenotypes of oxacillin susceptibility and 3 (0.7%) with cefoxitin susceptibility were exclusively noted in molecularly CA-MRSA.

Conclusions: Low level resistance againt oxacillin, cefoxitin, and vancomycin are found among CA-MRSA. MRSA does not harbor higher vancomycin resistance than MSSA. Cefoxitin and oxacillin agar dilution could be used as excellent tools in screening MRSA isolates mostly from nonsterile site.