Emm (M Protein Gene) Sequences of Invasive Group A Streptococci Isolates from Thai Patients at Chulalongkorn University Hospital from 1995 -1999

Objective: Previous study of the incidence and pattern of invasive group A streptococci (GAS) at Chulalongkorn University Hospital (CUH) demonstrated an increase in incidence and a wide variety of clinical features. In this study, we are interested in analyzing the variability of emm gene which encode a major virulence factor, M protein, from these invasive GAS isolates.

Methods: The study involved 41 invasive GAS infections in the patients admitted to CUH from January 1, 1995 to December 31, 1999. Strains were confirmed as GAS by latex agglutination grouping. The emm genes were amplified by PCR and subjected to direct sequencing method according to CDC protocol.

Results: Of the 41 invasive GAS isolates analyzed, 39 emm genes can be amplified with 24 different emm sequences. Ten of the 24 emm types were standard emm types emm1, emm11, emm22, emm23, emm25, emm35, emm49, emm58, emm61, emm68; with one provisional emm types pt3875; and two were previously identified emm sequence types TR2612 and cmuj76. The other nine emm sequences have similar sequences to GAS strains STBSA29, Sp11014/M15, SS1448, SS1444, STNS1, NS5, 2034.92, 6949-99, ST14935; however, the name of emm types has never been previously assigned for these sequences. Lastly, 2 novel emm sequence types were discovered in this study from strain NSRT1 and NSRT2 that have some homology to emm43 and emm60, respectively. Interestingly, the emm types that were commonly found in this invasive GAS infection include emm22 (4 isolates), emm1 (4 isolates), emm25 (3 isolates), emm61 (3 isolates), emm from NSRT1 (3 isolates), emm68 (2 isolates), and emm from STBSA29 (2 isolates).

Conclusions: A variety of emm sequences have been reported in this study including the identification of 2 novel emm types. The emm gene sequencing (emm typing) is an effective tool to characterize the variability and the prevalent of invasive GAS isolated.