

ABSTRACT

A significant proportion of physicians lack core knowledge about colonization or hospital infection. Beta-lactam antibiotics are among the most frequently prescribed drugs worldwide in the control of *Staphylococcus aureus* infection. In response to the increasing rate of antibiotic resistance in *S.aureus*, in the current study we have conducted a longitudinal study which aims to analyze the antibiotic susceptibility patterns, the synthesis of beta-lactamase and its association to antibiotic resistance among exposed year two medical students at AIMST University (February 2013 to January 2014). A total of 200 medical students from year 2 were identified for this study. A self administered questionnaire was distributed and nasal swabs were collected. Two phases of sample collection were done (before and after hospital exposure). A series of identification and differentiating tests were conducted for precise identification of resistant *S.aureus* and MRSA bacteria. The selected resistant strains were inoculated on Brilliance MRSA 2 Agar that is specific for MRSA. All the positive *S.aureus* samples were monitored for beta-lactamase production and the commonest beta-lactamase type of *S.aureus* in the nasal carriage of students were identified. Student's demographic details and knowledge and awareness on MRSA were assessed followed by the categorical analysis (Chi-square and T-test) performed to analyse the factors associated with *S. aureus* nasal carriage. The relationship between resistant *S.aureus* and beta-lactamase production was analysed using Pearson correlation test. Forty-four (29.5%) *S.aureus* strains were isolated from 149 nasal swab samples. The prevalence of MRSA was 13.6%. Resistance to methicillin group of drug and multiple drugs resistance were found to be raised after hospital exposure. A significant correlation was found between resistant strains and beta-lactamase production ($r=1$, $p<0.05$). Majority of the students (71.4%) carried type A beta-lactamase producing *S.aureus* in their nostrils. We conclude that the potential of acquiring MDR and MRSA carriage among medical students increases after the hospital exposure. Moreover, marked differences in the stability of the commonly used beta-lactam to hydrolysis by the staphylococcal beta-lactamase is present. This heterogeneity and the clinical implications thereof need to be considered in the antibiotic management of staphylococcal infection.