

Comparison of bacteriological, biochemical and molecular characterization between methicillin resistant and methicillin sensitive Staphylococcus aureus among the clinical isolates of under-5 years-old children suffering from pneumonia and/or lower respiratory tract infection in Malaysia

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Abstract

Staphylococcus aureus is one of the commonly isolated human pathogen important in causing several infections including childhood pneumonia. *S. aureus* often develops resistance to penicillin, ceftioxin, aminoglycosides, cephalosporins &/or β -lactams, but termed as 'MRSA' when it becomes resistant to oxacillin &/or methicillin. *S. aureus* according to different studies causes pneumonia ranging in 7-44% Malaysian children, but, MRSA in particular accounts for 3-5% community-acquired pneumonia (CAP) worldwide, including Malaysia. Since, reports on molecular epidemiology of MRSA remain scarce in Malaysian children, this research compared bacteriological, biochemical and molecular analysis between MRSA & MSSA (methicillin sensitive *S.aureus*) isolated from nasopharyngeal swabs (NPS) of pneumonic children. Total 220 randomly selected <5 years-old children admitted in two hospitals of Kedah, Malaysia were studied. With written consent from mother/guardian, NPS were cultured on to Mannitol salt and Blood agar plates. Following overnight aerobic-incubation (35-37°C) colony morphology were read, Gram-stained and bio-chemical (positive catalase and coagulase; and, CHO-fermentation) identifications recorded. Antimicrobial susceptibility-AST were tested with AMC20, CRO30, CIP5, E15, CN10, OX1, S10, TE30 and VA30 and, MRSA strains were detected based on Oxacillin-resistance. Clinical diagnosis (by pediatricians) revealed 76% pneumonic cases among those hospitalized-children. Phenotypically, *S. aureus* was isolated from NPS of 32.6% pneumonic-children, 39.4% of which revealed as MRSA. For genotypic analysis, PCR was performed using two specific-primers: femA (*S. aureus*) and mecA (MRSA) and band-size were determined using agarose gel electrophoresis. Laboratory finding evidences less of MRSA prevalence using genotypic (32%) compared to that of phenotypic (39%) identification. No differences was obvious between MRSA and MSSA phenotypic methods, except in molecular method ($p < 0.00$). Significant difference was observed between pneumonia and MRSA/MSSA ($p < 0.04$) and with femA/mecA ($p < 0.00$). These observations on

nasopharyngeal *S. aureus* suggest that MSSA can also play an important role as potential cause of childhood-pneumonia other than MRSA, in small proportion. The present study strongly demands more detailed molecular-epidemiological research comparing the role of MSSA and MRSA to elucidate their genetic diversities associated with causing childhood pneumonia



Biography:

Rayhan Ahmed is Mid fresh level graduate with more than 3 years experience. Worked as a Research Assistant during 2 years research based Master of Science in Microbiology at AIMST University, Malaysia. Currently playing the role of Executive Microbiologist at Cephalosporin Division of the IBN Sina Pharmaceutical Industry Limited, Bangladesh. Experienced in Sterile facilities, Aseptic Techniques, Microbial Analysis of non sterile products, Bacterial Endotoxin Testing, Environmental Monitoring of classified area, Generation of periodic Trend Report. Sound knowledge on GMP, GDP, cGMP etc.

Speaker Publications:

1. Microbial load, antimicrobial sensitivity and plasmid profiles of *Vibrio cholerae* in fruit juice
publication date Aug 10, 2014 publication
description International Journal of Natural and Social Sciences
1 (2014) 82-90. ISSN: 2313-4461

2. Isolation of Arsenite resistant bacteria from ground water and soil of Dhaka, Bangladesh.

publication date Apr 20, 2016.

3. Comparative insights on clinico-epidemiological and bacteriological features of pneumonia among Bangladeshi and Malaysian Children: Does socio-economic status matter?

Publication date Mar 30, 2016

4. Methicillin sensitive and resistant *S. aureus* isolated from naso-pharynx of clinically diagnosed children suffering from pneumonia: Cross-sectional observation from on-going study in two hospitals in Kedah, Malaysia, Dec 27, 2015

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