Multiplex PCR for the Detection of Genes Encoding Aminoglycoside

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Background & Objectives: *Staphylococcus aureus* is one of the common pyogenic bacteriapossessing highest potentiality to develop resistance to even new antibiotics. Emergence of resistance towards the most common antibiotics such as aminoglycoside, vancomycin and even carbapenems has added burden to the existing MRSA situation. Aminoglycoside are important bactericidal agents used for the treatment of many bacterial infections, including those caused by S. aureus. The aminoglycoside resistance is drug inactivation by plasmid- or transposon-mediated aminoglycoside modifying enzymes. The main purpose was to develop Multiplex-PCR assay for simultaneous detection of the genes encoding aminoglycosides.

Methods: Various clinical specimens were identified as *S. aureus* based on standard bacteriological procedures. Antibiogram was performed by disk agar diffusion Methods. Extraction of genomic DNA was carried out by SDS-Proteinase K methods modified with CTAB. The Multiplex-PCR assay for the presence of (mecA, nuc, femB) and (genes encoding aminoglycosides) respectively was carried out at an annealing temperature of 55°C and 54°C.

Results: Among 1,389 specimens, 90 S. aureus were isolated and identified. Antibiotic pattern is shown in the following Table. However nuc, femB and mecA gene srespectively were revealed in 100% (90), 86 (95/6%) and 58 (64/4%) strains while. Also 50% (45), 46.7% (42) and 48.9% (44) strains respectively were found to harbor aph(3′)-IIIa, ant(4′)-Ia and aac(6′)/aph(2″) genes.

Conclusion: The multiplex PCR Methods described herein is a convenient methods for rapid detection of the presence of to aminoglycoside resistance genes in *Staphylococcus aureus*. aph(3′)-IIIa gene is the most frequently encountered AME in staphylococcal isolates from Tabriz.

Keywords: *Staphylococcus aureus*; Aminoglycoside; Multiplex PCR