

Studies on Virulence Factors Analysis in Streptococcus agalactiae from the Clinical Isolates

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Abstract : Streptococcus agalactiae is commonly known as Group B Streptococcus (GBS) and it is the most common cause of life-threatening bacterial infection. GBS first considered as a veterinary pathogen causing mastitis in cattle later becomes a human pathogen for severe neonatal infections. In this present study, a total of 20 new clinical isolates of S. agalactiae were collected from male (6) and female patient (14) with different age group. The isolates were from Urinary tract infection (UTI), blood, pus and eye ulcer. All the 20 S. agalactiae isolates has clear hemolysis properties on blood agar medium and were identified by serogrouping and MALDI-TOF-MS analysis. Antibiotic susceptibility/resistance test was performed for 20 S. agalactiae isolates, further phenotypic resistance pattern was observed for tetracycline, vancomycin, ampicillin and penicillin. Genotypically we found two antibiotic resistance genes such as Betalactem antibiotic resistance gene (Tem) (70%) and tetracycline resistance gene Tet(O) 15% in our isolates. Six virulence factors encoding genes were performed by PCR in twenty GBS isolates, cfb gene (100%), followed by, cylE(90.47%), lmp(85.7%), bca(71.42%), rib (38%) and low frequency in bac gene (4.76%) were determined. Most of the S. agalactiae isolates produced strong biofilm in the polystyrene surface (hydrophobic), and low-level biofilm formation was found in glass tube (hydrophilic) surface. lytR is secreted protein and localized in bacterial cell wall, extra cellular membrane, and cytoplasm. In silico docking studies were performed for lytR protein with four antibiofilm compounds, including a peptide (PR39) with the docking study showed peptide has strong interaction followed by ellagic acid and interaction length is 2.95, 2.97 and 2.95 Å. In ligand EGCGO10 and O11 two atoms interact with lytR (Leu271), with binding bond affinity length is 3.24 and 3.14. The aminoacid Leu 271 is act as an important aminoacid, since ellagic acid and EGCG interact with same aminoacid.

Keywords : antibiotics, biofilms, clinical isolates, S. agalactiae, virulence

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