The Streptococcus anginosus group: molecular pathogenicity of invasive infections—review of the literature

Abstract

Streptococcus intermedius, Streptococcus constellatus, and Streptococcus anginosus constitute the Streptococcus anginosus group. These species and subspecies, part of the human flora of the oropharynx and gastrointestinal tract, are clinically related to invasive pyogenic infections and a tendency to form abscesses. Synergy between members of the S. anginosus group and oral anaerobes has been described.

The purpose of this study is to review the various virulence factors described in literature that are involved in the pathogenicity of invasive infections due to the members of the Streptococcus anginosus group. The repertoire includes a variety of factors: Expression of adhesion for adherence to substrates. A cell surface protein that can bind fibronectin, platelets, fibrin, fibrin clots, and fibrinogen, mostly involved in pathogenesis of infective endocarditis. The presence of a polysaccharide capsule that provides the ability to escape phagocytosis. Production of intermedilysin, a cytolytic toxin specific for human cells that has been proved to involve in liver abscess formation. Production of hydrolytic enzymes that facilitate the local spread through tissues, such as hyaluronidase, deoxyribonuclease, chondroitin sulfatase, and glycosaminoglycan depolymerase. The immunosuppressive and B-cell mitogenic protein P90 that is produced by S. intermedius that stimulates suppressor lymphocytes. The superantigen genes speM, ssa, and smeZ that have been reported to be transferred from Streptococcus pyogenes to members of the anginosus group. The S. anginosus group members seem to stimulate less chemotaxis than Staphylococcus aureus, a characteristic that facilitates abscess formation. Streptococcus intermedius isolated from abscesses seems to express a small protein similar to phenol-soluble modulin β1, a well-known staphylococcal virulence factor.

The above mentioned virulence factors differentiate the Streptococcus anginosus group members from the other viridans Streptococci. Given the aging population, immunosuppression and chronic illness, understanding those mechanisms is crucial in order to prevent and treat the invasive pyogenic infections caused by these species.

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