

The role of hyaluronic acid capsular material of *Streptococcus equi* subsp. *zooepidemicus* in mediating adherence to HeLa cells and in resisting phagocytosis

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Abstract

Hyaluronic acid is thought to be one of the critical virulence factors of *Streptococcus equi* subsp. *zooepidemicus*. The present study was designed to study the role of hyaluronic acid capsular material in mediating adherence and to resist the phagocytosis of the host's immune defence. The studies were performed with two encapsulated *S. equi* subsp. *zooepidemicus* and two unencapsulated phase variants. The bacteria had been previously isolated from diseased pigs and monkeys in Indonesia. The presence of capsular material was determined using the hyaluronic acid decapsulation test and by electron microscopic studies. Both encapsulated bacteria showed mucoid colonies after cultivation on blood agar, grew with diffuse colonies in soft agar media and reacted negatively in the salt aggregation test. The unencapsulated bacteria grew with small colonies on blood agar, formed compact colonies in soft agar media and reacted positively in the salt aggregation test. Adherence and phagocytosis studies revealed that the encapsulated bacteria adhered significantly more to HeLa cells and were less phagocytosed by murine macrophages compared to unencapsulated bacteria. Pretreatment of the HeLa cells using hyaluronic acid or pretreatment of the bacteria by hyaluronidase decreased the adherence value of encapsulated bacteria. Pretreatment of bacteria with pronase had no effect. The presented results strongly indicate that the hyaluronic acid capsular material contributes to adherence properties of *S. equi* subsp. *zooepidemicus* and might help the bacteria to resist phagocytosis by macrophages.

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