

BIOCHEMICAL AND SEROLOGICAL CHARACTERISTICS OF STREPTOCOCCI  
ISOLATED FROM THE UROGENITAL TRACT OF HEALTHY SOWS AND SOWS WITH PUERPERAL DISORDERS  
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To answer the question which species of Streptococci were able to cause acute post partum endometritis in the sow, we ascertained the species and the amount of Streptococci in swabs taken from the mucosa of the genital tract. These specimens were taken from sows kept on a farm with increased occurrence of puerperal disorders. This was followed by a bacteriological control of urine. From 564 isolated strains of Streptococci 438 strains were further differentiated by biochemical and serological methods in the Center for Streptococcus Research at the Institut für Hygiene der Bundesforschungsanstalt für Milchwirtschaft in Kiel. Information about pathogenic abilities of isolated Streptococci was tried to obtain by the aid of clinical parameters and cytological results of swabs. The swabs and the clinical examination were always carried out at days 1-3 post partum.

#### Results

Vaginal vestibulum: 27.9 % of 201 Streptococcus strains isolated from this part could not be further differentiated. The remaining 72.1 % consisted of 23.4 % *Sc. uberis* and 21.9 % *Sc. viridans* and *Sc. MG*. Further 16.4 % belonged to the serological group D. The majority could be classified as *Sc. faecalis* and *Sc. faecalis* var. *liquefaciens*. 5 % were identified as *Sc. pyogenes humanus* C.

Vagina, cervix, uterus: 21.5 % of 237 strains of Streptococci isolated from the vagina, from the cervical channel and from the post partum uterus could not be clearly differentiated. 29.1 % belonged to group D with a predominance of *Sc. faecalis* and *Sc. faecium*. 23.6 % were rated among group E (*Sc. uberis*) and 12.7 % among *Sc. viridans* and *Sc. MG*. The amount of Streptococci out of the total number of aerob grown colonies differed from 1-100 %. In 7 cases pure cultures of a certain species of Streptococcus were found: 1x *Sc. pyog. human. C*, 2x *Sc. uberis*, 2x *Sc. faecium* and 1 pure culture *Sc. spec.*

Testing of potential pathogenic activities of Streptococci: To find out whether the isolated species of Streptococci were able to cause pathological alterations in the puerperal genital tract only sows were tested which were proved having in vagina, cervix and uterus a) pure cultures of a certain species of Streptococcus, b) a predominance of Streptococci (> 80 % Streptococci out of the total bacterial amount), c) a high number of Streptococcus colonies (> 4.500/swab) and d) no or only few enterobacteria (< 20 %).

The above mentioned prerequisites were found in 29 sows.

Amongst the 6 animals exhibiting a monoinfection of Streptococcus of the puerperal uterus no pathological symptoms could be found in 2 animals having a uterine infection with *Sc. faecium* resp. *Sc. uberis*.

A peculiar situation revealed one sow suffering from a *Sc. faecium* infection of the uterus. There was severe fluor genitalis, considerable exsudate both in the cervical channel and in the uterus. But rectal temperature was normal and the general status of the sow was undisturbed. In this case the infection of the uterus might be

due to ascending migration from the chronically infected urinary tract. High numbers of *Sc. faecium* ( $12.0 \times 10^6$ /ml) had been present already in the urine ante partum.

The infection of the genital tract with *Sc. pyog. human. C* in one sow was followed by light to medium puerperal disorder.

Symptoms of severe puerperal disorders were manifest in two sows, causing considerably reduced general condition. The reasons were uterine infections with *Sc. faecalis* resp. *Sc. uberis*.

Amongst the 23 cases with a predominance of Streptococcus in the culture 9 cases (4x *Sc. uberis*, 1x *Sc. serological group F*, biotype II, 4x *Sc. not differentiable*) did not suffer from clinical symptoms and revealed undisturbed general status.

In 8 cases (1x *Sc. pyog. human. C*, 1x *Sc. faecalis*, 1x *Sc. faecium*, 2x *Sc. uberis*, 3x *Sc. not to be differentiated*) the general degree of illness had to be classified as light in spite of a high number of bacteria (> 65.000/swab) and severe fluor genitalis and numerous leucocytes in the uterine exsudate, respectively.

Only in 6 sows the Streptococcus infections of the genital tract (*Sc. serolog. group B*, *Sc. pyog. human. C*, *Sc. faecium*, *Sc. uberis*, *Sc. MG*, *Sc. spec.*) had caused a medium to severe febrile infection with evident symptoms of endometritis puerperalis. In this group were found 3 sows suffering from chronic urinary tract infection with Streptococci (*Sc. pyog. human. C*, *Sc. faecium*, *Sc. uberis*) during pregnancy. The Streptococci found in the urine and in the puerperal uterus were biochemically and serologically identical.

#### Discussion and conclusions

Streptococci seem to be important in the etiology and the pathogenesis of acute endometritis puerperalis in the sow. Even harmless species usually found in the intestines may ascend post partum into the uterus and multiply there. But this does not generally result in endometritis and systemic disease. According to the present investigation in about one third of these infections a clinically manifest disorder will result reducing the sows performance. The question why a species of *Sc.* intruding the uterus causes in one case an acute endometritis and does not in another can't be answered clearly.

Not only certain properties of the bacterium and the dosis of infection are of influence but also several endogenous and exogenous factors may interfere and finally determine the future of the infection.

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