Managing strangles in 2019

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This seminar will provide an update on optimal diagnostics of acute and detection silent carriers of strangles and the effectiveness of sanitation procedures on potential fomites in the strangles horses' environment.

Adoption of PCR for diagnostics has greatly enhanced our ability to diagnose the acute disease regardless of variation in clinical signs (1,3). At least one in ten of horses recovering from strangles will carry *S. equi* silently, with the bacteria surviving within guttural pouches (2). These animals are undoubtedly key culprits in the spread of strangles to naïve groups of horses. Alternatively, disease transmission via fomites is also implicated in disease spread.

Simple nasal swab PCRs in acute strangles are diagnostic (1) but carrier state detection requires either nasal lavage or guttural pouch sampling (2). We have recently shown (Fig1) that, while the guttural pouch is the optimal site for obtaining viable *S. equi*, both sampling methods optimize carrier state detection (2). Moreover, horses solely positive on PCR to *S. equi* host viable bacteria (2)

Practitioners in the field are reluctant to use their endoscopes for sampling for *S. equi*. We tested commonly used field cleaning protocols on endoscopes used in guttural pouch sampling of strangles carriers. Viable bacteria are eliminated using routine cleaning protocols. However, removal of all bacterial DNA is more difficult. Thus, endoscopes themselves can contribute to false PCR positives in sampling for strangles carriers. On the other hand, routine cleaning and disinfection of stables and riding equipment does effectively eliminate viable *S. equi* for most materials, apart from braided polyesters in many horses halters (Table 2).
In summary, diagnosis of strangles has been greatly improved with the advent of PCR. With proper biosecurity and sanitation of fomites associated with strangles cases, attention should focus on management of silent carriers.

References:

1. Lindahl, S. Aspán A. Egenvall, A, Båverud. V, Pringle, J. Evaluation of sampling techniques and real-time PCR for improved detection rate of Streptococcus equi subsp equi in horses with strangles. J Vet Int Med 2013; 27:542-7.
2. Riihimäki M, Aspan A, Ljung , H, Pringle J. Long term dynamics of a Streptococcus equi ssp equi outbreak, assessed by qPCR and culture and seM sequencing in silent carriers of strangles. Vet Micro 2018: 223:107-112
3. Tscheschlok L, Venner M, Steward K, Böse R, Riihimäki M, Pringle J. Decreased Clinical Severity of Strangles in Weanlings Associated with Restricted Seroconversion to Optimized Streptococcus equi ssp equi Assays. J Vet Intern Med 2018;32:459-464

Figure 1. Sampling for long term carriers in two strangles outbreaks. As modified from: Pringle et al, 2019 Vet J in press.

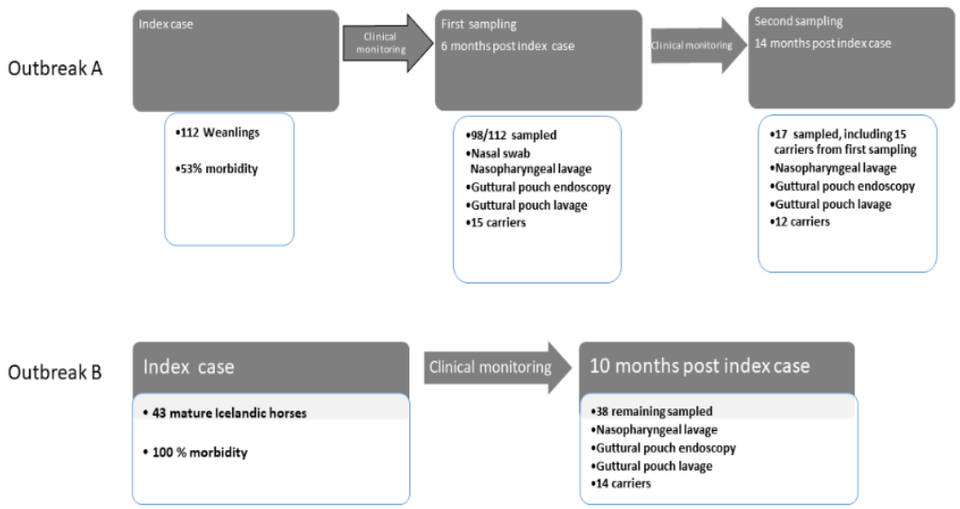

Table 1: Culture and PCR after field cleaning and disinfection from endoscopes used on confirmed silent carriers of *S equi;* 5 carriers were bacterial culture positive (Svonni E et al, ECEIM 2017).

Endoscope	*Horses examined*	*Positive samples from examined horses (guttural pouches and/or nasal lavage)*	*Culture Positive samples from endoscope after cleaning and disinfection*	*Positive qPCR from endoscope after cleaning and disinfection*
A	*16*	*6/16*	*0/6*	*0/6*
B	*14*	*6/14*	*0/6*	*1/6*
C	*8*	*4/8*	*0/4*	*0/4*
A, B and C	*38*	*16/38*	*0/16*	*1/16*

Table 2. Survival of *S. equi* on inoculated material after cleaning and sanitation and on controls (From Ryden A, BEVA abstract 2017)

Material	Control 3d	Control 5d	After cleaning and sanitation
Concrete	8[c]/8[d]	8/8	0/8 ($p<0.001$)
Untreated wood	8/8	8/8	0/8 ($p<0.001$)
Plastic	8/8	8/8	0/8 ($p<0.001$)
Leather halter	4/8	1/8	0/8 ($p<0.001$)
Leather gloves	7/8	0/8	0/8 ($p<0.001$)
Polyester halter	8/8	8/8	6/8