Seminal vesiculitis, balanoposthitis and IBR

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Introduction
Seminal vesiculitis and balanoposthitis are problems often encountered by Australian cattle veterinarians when examining bulls for breeding soundness.

Seminal vesiculitis
The prevalence of seminal vesiculitis (vesicular adenitis) has not been determined in Australia but is common in the author’s experience, especially in young bulls being prepared for sale. Seminal vesiculitis has been detected in 0.85–10% of yearling bulls during routine breeding soundness evaluations in north America, with up to 49% of yearling bulls showing evidence of clinical or subclinical vesiculitis at slaughter.

The exact cause of vesiculitis is not known but a range of theories exist. These include haematogenous spread from infections in other parts of the body and reflux of semen and urine into the accessory sex glands during ejaculation, resulting in inflammation and subsequent infection with common commensal organisms of the urogenital tract.

A range of bacteria can be isolated from aseptically collected semen samples from bulls with vesiculitis including Histophilus somni and Trueperella (formerly known as Actinomyces and Arcanobacterium) pyogenes.

A Canadian study examined the use of tulathromycin (Draxxin®) and tilmicosin (Micotil®) for treating bulls. Prior testing indicated these drugs reached therapeutic levels in seminal vesicular fluid and that there was evidence the drugs were effective against the range of pathogens that have been isolated from vesiculitis cases. The registered label doses of both drugs were used in the study. A single dose of tulathromycin, or two treatments with tilmicosin were given 3 days apart, with the aim of maintaining effective antibiotic levels in seminal fluid for at least 6 days.

A total of 180 veterinarians in large animal practices in Alberta, Manitoba, and Saskatchewan, Canada, were approached to participate in the study. Eligible cases of seminal vesiculitis were those in which clots or flakes of pus were visible in semen samples, white blood cells were found at ≥1 per five microscope fields at 1000x magnification, the vesicular glands were enlarged and hardened, and there was no record of previous antibiotic treatment.

Response to treatment was determined 21–28 days after the beginning of treatment. A positive response was considered to be: no clots of pus in the semen, no flakes of pus in the bottom of the tube after five minutes of settling time, and ≤1 white blood cell per microscope field at 1000x magnification. Gland size and hardness were often reduced in bulls with a positive response, but this was not required to qualify as a positive response. Aseptically collected semen samples were also collected from cases and cultured at a diagnostic laboratory. In the control group, the possibility of spontaneous remission was investigated at >3 weeks from the discovery of the case.

Seventeen veterinarians enrolled a total of 65 bulls in the study. The split between treatment groups and recovery rate by treatment are given in Table 1.
Table 1. Number of animals by treatment group and recovery rate.

<table>
<thead>
<tr>
<th>Treatment group</th>
<th>Treated (n)</th>
<th>Recovered (n)</th>
<th>Recovery rate</th>
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<tbody>
<tr>
<td>Tulathromycin</td>
<td>25</td>
<td>22</td>
<td>88%</td>
</tr>
<tr>
<td>Tilmicosin</td>
<td>23</td>
<td>11</td>
<td>48%</td>
</tr>
<tr>
<td>Control</td>
<td>17</td>
<td>0</td>
<td>0%</td>
</tr>
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</table>

The recovery rate was higher for bulls treated with tulathromycin than for tilmicosin and both antibiotics resulted in higher recovery rates than the untreated control group (P < 0.01). In the tulathromycin group, six bulls were mature (four 2 year old and two 3 year old), but the three bulls that did not recover were yearlings. In the tilmicosin group, five bulls were mature (three 2 year old, one 4 year old, and one 6 year old). Two of the 2 year old bulls treated with tilmicosin recovered, but the other mature bulls did not. In the control group, all bulls were yearlings and none recovered.

Based on the outcome, both tilmicosin and tulathromycin should be useful in the treatment of vesiculitis. However, re-treatment of bulls with tilmicosin in Australia invalidates the registered WHP and ESI of the product. This should be considered carefully as neither treatment is 100% effective, and bulls that fail treatment may need to be sold for slaughter.

Both antibiotics resulted in cures of seminal vesiculitis (as defined for this study), including some bulls that were ≥2 years old. Although the time of onset of seminal vesiculitis in these bulls could not be determined, it is likely that the infections were of a chronic nature. The risk of subsequent relapse was not evaluated.

While the cause of seminal vesiculitis is still uncertain, this study provides an appropriate and effective treatment for the condition.

Balanoposthitis and IBR
Anecdotal reports suggest the incidence of balanoposthitis may be increasing in southern Australian beef herds. A number of organisms have been isolated from clinical cases, including bovine herpes virus 1 (BHV-1), the causative agent of infectious bovine rhinotracheitis (IBR).

Bovine herpes virus 1.2b is believed to be the predominant subtype of this virus in Australian cattle herds and causes respiratory disease (IBR), infectious pustular vulvovaginitis in heifers and cows (IPV) and balanoposthitis in bulls (IBP). It does not cause abortion in pregnant cattle, unlike BHV 1.1 viruses which are believed to be exotic to Australia, but are the predominant subtype in North America and Europe.

As part of a larger study to evaluate the prevalence of a number of important reproductive diseases in dairy bulls being used for natural mating in Victoria, sampling for BHV-1 virus was undertaken.

A sub-population of 256 bulls from 32 farms in south-west Victoria was sampled. Prior to the mating period, all bulls showing signs of balanoposthitis (n = 10, 5 farms) were sampled for BHV-1. It was planned to test all enrolled bulls after the mating period, but logistical problems resulted in bulls from only 19 herds being tested (n = 118 bulls). The post mating samples were taken from bulls with and without signs of balanoposthitis.

The case definition for a case of balanoposthitis was a diffuse red rash on the penile surface with or without pustules and exudate or evidence of healing lesions and
associated scar tissue.

A sample of the surface of the penis from the affected area was taken using a dry swab and submitted immediately to a laboratory (Gribbles, Clayton, VIC, Australia) for real-time PCR assay, looking for the presence of BHV-1. The PCR was performed according to OIE standards for diagnosis of BHV-1. This test has a reported sensitivity of 83% and specificity of 94%.

<table>
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<tr>
<th>Table 2. Sampling information and results of BHV-1 PCR of samples from dairy herd bulls in south-west Victoria, Australia</th>
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<tbody>
<tr>
<td>All samples (pre- and post-mating) 7.8 (10/128)</td>
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<tr>
<td>Bulls with lesions pre-mating 40.0 (4/10)</td>
</tr>
<tr>
<td>Bulls with lesions post-mating 9.1 (1/11)</td>
</tr>
<tr>
<td>Bulls without lesions post-mating 4.7 (5/107)</td>
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</table>

BHV-1, bovine herpes virus-1.

The odds of being PCR positive for BHV-1 was increased by a factor of 6 (95% CI 1.6 – 23.1, Chi Squared P=0.004) in bulls with balanoposthitis lesions compared to bulls without lesions. A breakdown of the results is given in Table 2. These results indicate the presence of genital BHV-1 infection in bulls in this study and provide evidence linking the detection of this virus with cases of balanoposthitis.

The discrepancies seen between the presence of lesions and a positive BHV-1 PCR test may be related to lesions seen in PCR negative bulls being caused by trauma or other pathogens such as Ureaplasma diversum which was not tested for in this study; latent infections with BHV-1; bulls having cleared the BHV-1 infection by the time of testing; and issues with the accuracy of the test employed. Although it was unable to be done in this study, it would have been useful to assess the pre- and post-mating BHV-1 antibody status of the bulls. Paired serology could clarify the ambiguity surrounding the presence of penile lesions in PCR negative bulls assuming infected bulls mount an effective humoral immune response.

The clinical findings presented here warrant further research into genital BHV infection in Australian bulls, in particular the efficacy of the two available vaccines for BHV-1 in Australia, Rhinogard® and Bovilis® MH+IBR in the control of the condition.

References