ABSTRACTS

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Tocodynamometry detects preterm labor in the bitch prior to luteolysis

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OBJECTIVES AND METHODS: Preterm labor (PTL), myometrial activity and accompanying cervical changes, can lead to the loss of pregnancy via resorption or abortion before term gestation. Idiopathic PTL has no metabolic, infectious, congenital, traumatic or toxic cause identified. Hypoluteoidism has been hypothesized to cause PTL in the bitch, based on progesterone measurements at the time of clinical pregnancy loss; the release of prostaglandins from the endometrium and placenta associated with pre-existing myometrial activity can result in this luteolysis.(1) Elective medical abortion in the bitch only results when progesterone levels are driven below 2 ng/mL; levels between 5-90 ng/mL are considered normal for diestrus and pregnancy.(2,3) Exogenous progesterone supplementation during pregnancy can inhibit the development of normal lactation and cause masculinization of female fetuses.(4) This study documents the use of tocodynamometry to detect PTL early in its course; progesterone measurements in these bitches were normal for pregnancy at the time PTL was diagnosed.

Five bitches with historical preterm labor resulting in pregnancy loss underwent proactive tocodynamometry following ultrasonographic pregnancy diagnosis at 31-36 days into their subsequent gestation.

RESULTS: Inappropriate myometrial contractions and irritability were recorded in all. (Fig 1-3) Progesterone levelsa taken at the time of the first tocodynamometry session were between 12.7-54.4 ng/mL. One bitch had follow up progesterone levels of 10.6 and 8.5 ng/mL. Therapy with the tocolytic agent terbutalineb (0.03-0.04 mg/kg po q 8-12h) was initiated and titrated to effect based on daily tocodynamometry. Terbutaline was discontinued day 63 of gestation, calculated as 64-66 days from the initial rise in progesterone (1.5-3 ng/mL) associated with the LH surge (4 cases), or the LH surge (1 case). Pregnancies were successful in all 5 bitches; 2 had elective Cesarean section (CS), 1 an emergency CS after partial delivery (5/7) and 2 had successful vaginal deliveries (Table 1). Progesterone supplementation was not required to maintain myometrial quiescence or litter size.

CONCLUSION: The early (< 40 days gestation) use of tocodynamometry in bitches with historical PTL can detect myometrial hypercontractility prior to the development of luteal insufficiency and facilitate therapy using the tocolytic drug terbutaline, avoiding the potential complications of progesterone supplementation during pregnancy. Tocolytic therapy may prevent the eventual development of critically low (< 2 ng/mL) progesterone levels pre term.

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Table 1: Breed (OES Old English Sheepdog), progesterone level (P4, ng/mL), day of gestation (Day), terbutaline dose (Terb, mg/kg) and litter size (LS) in bitches with pre term labor.

<table>
<thead>
<tr>
<th>Breed</th>
<th>P4</th>
<th>Day</th>
<th>Terb</th>
<th>LS</th>
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<tbody>
<tr>
<td>OES</td>
<td>12.7</td>
<td>37</td>
<td>0.03 q8</td>
<td>3</td>
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<tr>
<td></td>
<td>10.6</td>
<td>39</td>
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<td>8.5</td>
<td>45</td>
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<td>Bernese Mt.</td>
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<td>31</td>
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<tr>
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<td>Schnauzer</td>
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<td>0.03 q12</td>
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</tbody>
</table>

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*a Siemens Immulite 2000 chemiluminescence assay Idexx Laboratories
*b Brethine (Pharma)
Figure 1: Tocodynamometry: Quiescent myometrium 41 days gestation. (x= mm Hg y=minutes)

Figure 2. Tocodynamometry: Myometrial irritability 36 days gestation. (x= mm Hg y=minutes)

Figure 3. Tocodynamometry: Myometrial contraction 36 days gestation. (x= mm Hg y=minutes)