Surfactant Protein D Concentrations in Serum and Bronchoalveolar Lavage Fluid From Young Healthy Horses

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Introduction & Background

- Serum surfactant protein D (SP-D) is considered a potential biomarker for equine asthma.
- SP-D is mostly produced by type 2 alveolar cells and Clara cells.
- SP-D levels are likely influenced by:
  - alterations in alveolocapillary membrane permeability,
  - concentration gradients
  - modifications in SP-D structure.
- The purpose of this study was:
  1. to evaluate SP-D concentrations in serum and BALF from young healthy horses
  2. to assess the effects of environment on these parameters.

Methods

- 20 young healthy horses (1-2 years old)
- Groups:
  - 10 horses moved into stall environment
  - 10 horses kept on pasture.
- Sample collections at
  - Baseline (all horses on pasture)
  - 2 weeks
  - 4 weeks.
- Physical Exam, endoscopy, bronchoalveolar lavage fluid (BALF) collection, and CBC at each sample.
- Evaluation of SP-D Concentrations in serum and cell-free BALF using commercial ELISA assay.

Results

No significant differences between groups or sampling times for PE, CBC, airway endoscopy, and BALF cytology.

Results (cont.)

Results for serum and BALF SP-D concentration are shown in the table below as median and range.

<table>
<thead>
<tr>
<th>SP-D</th>
<th>Baseline</th>
<th>2w</th>
<th>4w</th>
<th>Baseline</th>
<th>2w</th>
<th>4w</th>
</tr>
</thead>
<tbody>
<tr>
<td>BALF (ng/ml)</td>
<td>4208±5870</td>
<td>2188±529</td>
<td>3407</td>
<td>3086</td>
<td>3347</td>
<td>3750</td>
</tr>
<tr>
<td>Serum (ng/ml)</td>
<td>24.1 ± 17.9</td>
<td>23.8 ± 11.3</td>
<td>18.3 ± 11.8</td>
<td>25.3 ± 13.6</td>
<td>25.8 ± 18.6</td>
<td></td>
</tr>
<tr>
<td>BALF/serum (ratio)</td>
<td>131.3 ± 29.1</td>
<td>80.2 ± 18.6</td>
<td>175.4 ± 120.9</td>
<td>144.4 ± 80.3</td>
<td>156.3 ± 20.3</td>
<td></td>
</tr>
</tbody>
</table>

Horses housed in the barn had significantly lower BALF SP-D concentrations after 2 weeks in the barn compared to baseline.

- Average BALF SP-D concentration was 3492 ± 1620 ng/ml.
- Average serum SP-D concentration 27 ± 17 ng/ml.
- Average ratio of SP-D BALF was 157 ± 97.

Discussion/Future Directions

- This study provides preliminary information about SP-D concentration in BALF compared to serum.
- Further studies are needed:
  - to assess individual variations in SP-D concentration
  - to evaluate effect of environment or disease on SP-D
  - to elucidate mechanisms of SP-D translocation from the lung to the systemic circulation.
- Variations in SP-D structure should also be assessed in association with respiratory disease.

Acknowledgements

This study was funded by Lincoln Memorial University CVM Intramural Research Grant.

We would like to thank the veterinarians, students, staff, and horses involved in sample collection that allowed us to gather our data.

References