Galactomannan analysis and immunodiffusion technique in the diagnosis of aspergillosis in penguins

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Effects of Oil on Wildlife 10th International Conference

ASPERGILLOSIS IN PENGUINS

Predisposition

• Anatomic and Physiologic
• Immune system
• Handling
• Oil
• Drugs

ASPERGILLOSIS IN PENGUINS

Difficulty in early diagnostic

• Nonspecific clinical signs
• RX: late alterations
• Limitations
  • Mycology
  • Low sensitivity
  • Histopathology
  • Sample collection

New diagnostic test

• Antigen detection
  • Galactomannan (Platelia® Aspergillus EIA)

Platelia® Aspergillus EIA

• Commercial Kit - BioRad
  • Human neutropenic hosts
  • Serum samples
  • High sensitivity and specificity
  • Few studies in animal hosts

Redig PT, Zoo and Wild Animal Medicine 178-181, 1993;


Objective

- Evaluate the performance of antibody detection by the immunodiffusion test (ID) and the galactomannan detection by Platelia Aspergillus for the diagnosis of aspergillosis in penguins from a rehabilitation centre.

Material and Methods

- **Immunodiffusion**
  - 35 serum samples:
    - 9 aspergillosis
    - 3 malaria
    - 2 cachexia
    - 21 healthy

- **Aspergillosis Gold standard**
  - 30 serum samples:
    - 5 aspergillosis
    - 3 malaria
    - 2 cachexia
    - 20 healthy

- **Statistical analyses**
  - Diagnostic test outcomes (n=35):
    - Aspergillosis:
      - Positives: 3/9 aspergillosis; 1/21 healthy

RESULTS

- Immunodiffusion test (n=35):
  - Positives: 3/9 aspergillosis; 1/21 healthy
Results

- **Platelia Aspergillus EIA**: cut-off 0.5

<table>
<thead>
<tr>
<th>Underlying disease</th>
<th>n</th>
<th>DO variation</th>
<th>Mean DO</th>
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<tbody>
<tr>
<td>Aspergillosis</td>
<td>5</td>
<td>1.76 to &gt;12.5</td>
<td>6.54</td>
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<tr>
<td>Malaria</td>
<td>3</td>
<td>1.46 to 3.59</td>
<td>2.52</td>
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<tr>
<td>Cachexia</td>
<td>2</td>
<td>2.31 to 3.88</td>
<td>3.09</td>
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<tr>
<td>None</td>
<td>20</td>
<td>3.71 to &gt;11.9</td>
<td>7.07</td>
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</tbody>
</table>

Discussion

- **Performance ID / Platelia EIA**

<table>
<thead>
<tr>
<th>Test</th>
<th>Se</th>
<th>Sp</th>
<th>PPV</th>
<th>NPV</th>
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<tbody>
<tr>
<td>ID</td>
<td>33%</td>
<td>96%</td>
<td>75%</td>
<td>81%</td>
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<tr>
<td>EIA</td>
<td>100%</td>
<td>0%</td>
<td>17%</td>
<td>0</td>
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</table>

- Redig, 1993; Russel et al., 2003; Silva-Filho & Ruopollo, 2006.

**CONCLUSION**

- Galactomannan testing of sera performed disappointingly in the diagnosis of invasive aspergillosis in penguins. An unacceptably high rate of false-positive results occurred. ID testing seems to still hold its place in the diagnosis of this condition, despite showing a very low sensitivity. New diagnostic modalities deserve investigation in the field.

Acknowledgments

Thank you!

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