New diagnostic tools for *Haemophilus parasuis* infection in pigs

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Porcine polyserositis (Glasser’s disease) caused by *Haemophilus parasuis* is a disease of increasing economic importance causing high morbidity and mortality in specific-pathogen-free or high health status pigs. The characterization of this bacterium has been neglected for long time due to its fastidious nature. Antigenic heterogeneity among *H. parasuis* has been demonstrated by various methods such as serotyping, morphology and protein profiles of outer membrane proteins. To date, 15 serotypes have been reported by immunodiffusion (ID) test using heat stable antigen.

Serotyping

*H. parasuis* has recently re-emerged as one of the major cause of nursery mortality. Antigenic characterization of prevalent strains of *H. parasuis* is essential for control and understanding the epidemiology of this infection as well as for developing effective vaccines. Several problems have been reported with serotyping by immunodiffusion test such as cross reactions within serotypes, and about one third of field isolates remaining untypable. A new method, Indirect haemagglutination (IHA) test, has been developed in our laboratory for serotyping *H. parasuis*. More than 30% of the field isolates remained untypable by ID test whereas about 15% remained untypable using IHA test.

Distribution of different serotypes of *H. parasuis* from 1991 to 2003 is presented in the Table. Serotype 4 was most prevalent in Quebec, however, the percentage of serotype 4 was considerably reduced during last few years. Similarly serotype 5 was also diminished from 16% to 12%. The incidence of other serotypes is increasing. The number of isolates belonging to serotypes 2 and 7 has increased by more than three times during last three years. Emergence of new serotypes such as serotype 1 and 12 has also been detected.

### Seroprevalence

<table>
<thead>
<tr>
<th>Serotypes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>7</th>
<th>9</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-1999</td>
<td>0</td>
<td>4.4</td>
<td>1.4</td>
<td>48.5</td>
<td>16</td>
<td>6</td>
<td>1.4</td>
<td>0</td>
<td>10.3</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>2000-2003</td>
<td>2.2</td>
<td>11.5</td>
<td>0.5</td>
<td>25.8</td>
<td>12.1</td>
<td>15.9</td>
<td>0.5</td>
<td>4.9</td>
<td>8.2</td>
<td>3.3</td>
<td>14.8</td>
</tr>
</tbody>
</table>

Detection of *H. parasuis* specific antigen in the tissues

Because of the fastidious nature of *H. parasuis*, isolation of this microorganism is not always successful. Thus, there is a need for developing method(s) to detect the *H. parasuis* specific antigen directly in the tissues. In our laboratory, monoclonal antibodies against OmpA and lipopolysaccharide epitopes of *H. parasuis* have been produced. Coagglutination test using these monoclonal antibodies has been developed to detect *H. parasuis* specific antigen in the tissues such as lung, brain, heart, and spleen.

Serological diagnosis

With a view to control and eventually eradicate *H. parasuis* infection in specific-pathogen-free (SPF) or high health status pigs, Dot-ELISA has been developed in our laboratory to detect antibodies against *H. parasuis* in the blood of infected pigs.

Reference:


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In the next issue, we will talk about the techniques that have been developed for the molecular typing of *H. parasuis* isolates.