COMMUNICATION I

A Preliminary Serological and Bacteriological Survey of Leptospirosis in Pigs in Selangor

RINGKASAN

Tiga ratus dan empat contoh serum serta 50 buah pinggang telah dikutip dari ternakan babi di Rumah Sembelih Shah Alam untuk mengkaji penyakit leptospirosis. Contoh-contoh serum diuji dengan ujian agglutinasi mikroskopik di atas 8 jenis serovar leptospira dan didapati 26.6% dari contoh-contoh serum tersebut mengandungi antibodi agglutinasi leptospira. Ujian serologi menunjuk bahawa 9.2% ternakan babi berkenaan mempunyai titer (>1.30) dengan serovar icterohaemorrhagiae, 5.3% dengan serovar pomona dan 4.3% dengan serovar tarassovi. Sembilan dari 81 serum yang positif mempunyai titer dengan 2 atau lebih jenis antigen. Kuman-kuman leptospira didapati dalam 2 kultur buah pinggang tetapi kuman-kuman tersebut tidak dapat diperasingkan oleh kerana pencamaran bakteria. Kepentingan di atas keputusan siasatan dan epidemiologi penyakit leptospirosis dalam ternakan babi dibincangkan.

SUMMARY

Three hundred and four serum samples and 50 kidneys were sampled from pigs at the Shah Alam Abattoir, Malaysia for evidence of leptospiral infection. The serum samples were tested against 8 leptospiral serovars and the overall prevalence of agglutinating antibodies was 26.6% as disclosed by the leptospiral microscopic agglutination test (MAT). Serological examination showed that 9.2% of the pigs had titres (>1:30) to icterohaemorrhagiae, 5.3% to pomona and 4.3 to tarassovi. Nine of the 81 positive sera had titres to 2 or more antigens. Leptospires were seen in two of the kidney cultures but the organisms could not be isolated due to excessive bacterial contamination. The significance of these findings in relation to the epidemiology of leptospiral infection in pigs is discussed.

INTRODUCTION

Outbreaks of abortion in pigs in Malaysia due to leptospirosis have been reported on several occasions (Brandenburg and Too, 1981; Joseph, 1979). In view of this and also because of limited information on leptospiral infection in animals in Malaysia, this preliminary investigation was undertaken to examine the serological and bacteriological prevalence of leptospiral infection in pigs in Selangor, Malaysia.

MATERIALS AND METHODS

Between November, 1981 and February 1982, 304 blood samples and 50 condemned kidneys were obtained from pigs submitted for slaughter at the Shah Alam Abattoir, Malaysia. The animals were from various parts of Selangor and comprised porkers (4 to 6 months old) and sows. The serum samples obtained were held at -20°C until subjected to the leptospiral microscopic agglutination test (MAT) (Cole et al., 1973). The lowest serum dilution tested was 1:30 after the addition of appropriate antigens. Eight antigens comprising 5 to 10 day-old-live cultures of serovars pomona, tarassovi, grippotyphosa, icterohaemorrhagiae, ballum, australis, hardjo and canicola grown in Korthof’s medium were tested. The procedure was conducted in plastic microtitre plates and agglutination reaction was examined by darkfield microscopy on transferring a drop from each well onto a clean microscope slide. The titre end-point was taken as the last well in which 50% or more agglutination was observed.

Kidney samples were processed within 12 hours of the animal being slaughtered. Approximately 3 grams of each kidney were removed aseptically, cut into small pieces and then macerated by forcing them through a sterile syringe into a universal bottle containing 15 ml of Korthof’s medium. Two-drop aliquots of the homogenate were cultured into Bijou bottles of semi-solid Fletcher’s medium containing 100 mg/ml or 400 mg/ml 5-flourouracil to inhibit bacterial growth. A ten-fold dilution of the homogenate was made and further two-drop aliquots were inoculated into the Fletcher’s medium. This made a total of 4 cultures for every kidney sampled. The kidney cultures were incubated at 30°C for 6 weeks and were examined weekly from the second week of incubation by darkfield micros-
 Twenty seven per cent (81/304) of the pigs had evidence of agglutinating antibodies to one or more leptospiral antigens, with titres ranging from 1:30 to 1:240. Table 1 summarizes the serological data obtained. Leptospires were seen in two of the 50 kidney cultures but were not serotyped due to excessive bacterial overgrowth and were eventually lost from the cultures.

PREVIOUS INVESTIGATIONS 

Previous investigations (Smith et al., 1961) on limited samples of pigs in Malaysia have indicated low (10.6%) prevalence of leptospiral infection. This current investigation, however, found that 26.6% of the animals examined had agglutinating antibodies to one or more leptospiral antigens. A survey in Selangor indicated a 7.7% prevalence of infection in pigs (Joseph, 1979). Our findings show that prevalence has increased by 3 times since then. It is difficult to conclude at this stage whether pigs in Malaysia maintain leptospires and act as a source of infection for other animals and man. A more detailed investigation is therefore necessary to elucidate this point.

Table 1

The distribution of titres to 8 leptospiral antigens in 304 pigs from the Shah Alam Abattoir, Malaysia

<table>
<thead>
<tr>
<th>Antigens</th>
<th>Positives</th>
<th>30*</th>
<th>60</th>
<th>120</th>
<th>240</th>
<th>% Positives</th>
</tr>
</thead>
<tbody>
<tr>
<td>icterohaemorrhagiae</td>
<td>28</td>
<td>20</td>
<td>3</td>
<td>5</td>
<td>-</td>
<td>9.2</td>
</tr>
<tr>
<td>pomona</td>
<td>16</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5.3</td>
</tr>
<tr>
<td>tarassovi</td>
<td>13</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>4.3</td>
</tr>
<tr>
<td>ballum</td>
<td>8</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.6</td>
</tr>
<tr>
<td>canicola</td>
<td>8</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.6</td>
</tr>
<tr>
<td>grippotyphosa</td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.6</td>
</tr>
<tr>
<td>australis</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>hardjo</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>81</strong></td>
<td><strong>66</strong></td>
<td><strong>7</strong></td>
<td><strong>7</strong></td>
<td><strong>1</strong></td>
<td><strong>26.6</strong></td>
</tr>
</tbody>
</table>

*Reciprocal of titres
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been established yet. Serovar _icterohaemorrhagiae_ has often been isolated from rats (Smith _et al._, 1961) and man (Tan, 1970) and it is highly likely that rats are the source of infection for pigs and man in this country.

The significance of _pomona_ and _tarassovi_ infections in pigs has not been investigated. Low prevalence of infection to these 2 serovars were indicated in this survey. No titres were obtained when our serum samples were tested against _hardjo_ antigen. This is in marked contrast to the situation in cattle, where more than 27% (238/887) of the animals had evidence of infection (Bahaman and Ibrahim, personal communication).

The bacteriological prevalence appears to be low (4%). It is unfortunate that the 2 positive cultures were overgrown by bacteria. Perhaps, with more adequate facilities to inhibit bacterial contamination, the bacteriological prevalence could have been higher.

This investigation reveals that there is a need for further studies regarding leptospiral infection in pigs in Malaysia not only in terms of the economic impact on the pig industry but also from the public health aspects.

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