A Survey of Filarial Parasites in the Peritoneal Cavity of Horses in Japan

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A Survey was conducted for filarial parasite in the peritoneal cavity and the peritoneum of horses from January, 1979 through April, 1987. In the survey, 262 thoroughbreds and 43 anglo-arabians were examined at necropsy at the Equine Research Institute, Japan Racing Association. A total of 256 filarial parasites were recovered from 66 (21.6%) of the horses examined. The numbers of the parasites per case ranged from 1 to 26. Filarial parasites were morphologically identified as 45 male and 210 female Setaria equina and as a female Setaria marshalli. A filarial parasite was observed in the hemorrhagic and granulomatous lesion on the peritoneum in each ten cases at the necropsy. These parasites were identified as female S. equina.

Key words: Setaria equina, Setaria marshalli, Setaria digitata, horse, peritoneal cavity

Setaria equina is well known as a common parasite in the peritoneal cavity of horses.1) The adult S. equina seems to be harmless in a normal horse.2) There are few reports on the prevalence of adult S. equina in horses. The adult Setaria digitata usually is harmless in the peritoneal cavity in cattle.1) However, if the larvae of this parasite infect horses, goats or sheep, they cause cerebrospinal setariosis.3,4) A larvae of S. digitata has been detected in the central nervous systems in horses, goats and sheep4) and also in the anterior chamber of the eye in horses.5) A few researchers reported that S. digitata was detected in the peritoneal cavity in horses.6,7) Setaria marshalli is usually observed in the peritoneal cavity of cattle and also in the peritoneal cavity of horses.6)

The present investigation was undertaken to obtain more knowledge and information on the prevalence of the filarial parasites in the peritoneal cavity of racehorses in Japan.

A total of 305 horses, 262 thoroughbreds and 43 anglo-arabians, were submitted for necropsy.

Table 1. Horses examined at necropsy for the survey of filarial parasites in peritoneal cavity

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<tr>
<th>Breed</th>
<th>Th</th>
<th>A-A</th>
<th>Total</th>
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<tbody>
<tr>
<td>M</td>
<td>175</td>
<td>23</td>
<td>198</td>
</tr>
<tr>
<td>F</td>
<td>74</td>
<td>11</td>
<td>85</td>
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<td>G</td>
<td>13</td>
<td>9</td>
<td>22</td>
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Age (av.): 4 years and 1 month, 1 year and 7 months

routine necropsy to the Pathology Division of the Equine Research Institute, Japan Racing Association (JRA) during the period from January 1979 to April 1987. These horses were chiefly stabled in training centers, JRA and euthanatized due to severe bone fracture or locomotive disease during racing or training. They consisted of 198 males, 85 females and 22 geldings aged of 1 to 22 years (Table 1). Necropsy was performed after euthanasia at the author's institute.

Samples for identification of the filarial parasites were obtained from the peritoneal cavity of the horses at the time of the necropsy. The filarial parasites were fixed in cold 70% alcohol with 5% glycerin. These parasites were cleared in a lacto-phenol solution composed of 2 volumes of glycerin, 1 of lactic acid, 1 of melted phenol crystals and 1 of distilled water. The parasites were observed microscopically in temporally wet mounts.8–10

Samples for histopathological examination were collected from horses with parasitic changes on the peritoneum at the time of the necropsy, and then fixed well in 10% neutral buffered formalin. Tissue blocks were embedded in paraffin and cut into sections 3 μm thick. The sections were stained with hematoxylin and eosin and observed microscopically. The identification of the parasites were done on the basis of morphological difference of their anterior and posterior parts.11

The frequency of the filarial infection in the horses is presented in Table 2. A total of 256 filarial parasites were recovered from 66 of 305 (21.6%) horses examined. The number of the parasites for each horse ranged from 1 to 26 and the average was 3.9. The frequency of filarial infection in males tended to be higher than that in females and geldings as shown in Table 2.

The filarial parasites detected in the peritoneal cavity were morphologically identified into 45 male and 210 female S.
equina and a female S. marshalli. S. equina was recovered from horses stabled in every places but S. marshalli was obtained only from a horse stabled in Ritto Training Center, JRA, located in Shiga Prefecture. In this examination, S. digitata was not detected from any horse. Each filarial parasite was detected macroscopically from the hemorrhagic or granulomatous lesions on the peritoneum of ten horses at the necropsy (Fig. 1). Half of them were detected in the peritoneum accompanied by hemorrhages and many tags of fibrin. The remainings were found in the diffuse, crusty and thickened peritoneum showing a granulomatous response (Fig. 1). Some parasites were calcified on the surface. Each parasites was surrounded by macrophages, lymphocytes, plasma cells and eosinophils. The peritoneum was markedly thickened (Figs. 2, 3). All the parasites occurring in the peritoneum were identified morphologically as female S. equina. So far, if the adult S. equina infects peritoneal cavity of a natural host, its damage has been regarded as being harmless. Many parasitic lesions caused by adult S. equina were observed in this study.

In this survey no S. digitata was detected in the peritoneal cavity of a horse, although a few incidences have been reported in that site. The migration of the immature S. digitata into an aberrant host, such as horses, goats and sheep, can cause cerebrospinal setariosis, but the
natural host shows little or no damage due to the parasite. The finding should be regarded as a demonstration of the parasitic adaptation to its natural host as opposed to the lack of adaptation to aberrant hosts.

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Literature Cited


要約

馬の腹腔内糸状虫の寄生状況（短報）：吉原農彦1）・及川正明1）・和田隆一1）・長谷川充弘1）・富岡義雄2）・兼子樹広2）（1）日本中央競馬会競走馬総合研究所, 2）日本中央競馬会栗東トレーニング・センター）を関東地方で繁殖され, 1979年1月から1987年4月の間に剖検されたサラブレッド種262例およびアングロ・アラブ種43例の馬の腹腔内糸状虫について, 寄生虫学的および病理組織学的に検索した。糸状虫は66例の馬の腹腔内より256匹検出され, その寄生率は21.6%であった。1個体より検出された虫体は1～26匹の範囲で, 平均3.9匹であった。腹腔内糸状虫はS. equina の雄45匹, 雌210匹およびS. marshalli の雌1匹に鑑別しだった。また, 出血巣あるいは肥厚した腹膜の肉芽腫病変より10例の糸状虫体が検出され, それらはいずれもS. equina の雄と同定された。