Two Cases of Parafilaria in Dairy Cattle and Treatment of Hemorrhage with Levamisole Topical Application

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Abstract. On June and August in 1989, cutaneous hemorrhagic parafilaria was found in two cattle among 30 pregnant dairy cattle transported from Hokkaido to Chiba Prefecture. One adult female worm was recovered from the blood spot in both cattle. Ivermectin oral administration, dosage rate of 200 μg/kg body weight, had no effect on the occurrence of the blood spots. Topical application of levamisole on a blood spot at a 2.5% concentration showed to stop the bleeding within a few minutes after treatment. This method was very easy to use at the farm situation where cutaneous hemorrhagic parafilaria was sporadically occurred. The disease has not been found in Chiba Prefecture on a whole since those cases in 1989.—Key words: cattle, chemotherapy, parafilaria.

Parafilaria bovicolia caused cutaneous hemorrhage has been found in the Philippines [11], India, Tunisia, Morocco, USSR, Rwanda, Burundi, Romania, Bulgaria, South Africa, Canada, France and Sweden [4, 8] and at the Gifu Prefecture in Japan [1]. In 1989, cutaneous hemorrhagic parafilaria was found in two cattle among 30 pregnant dairy cattle Holstein Friesian transported from Hokkaido to Chiba Prefecture (Table 1). After diagnosis with worm detection from the lesions, two drugs of chemotherapy were applied. One was ivermectin (IVM; Eqvalen-Paste, MSD AGVET) by oral administration at a dosage rate of 200 μg/kg body weight. The other was levamisole (LEV; Ripercol-L Soluble-Powder, Lederle) which was topically applied on a blood spot at a 2.5% concentration in water.

Case 1: This animal was born on March 16, 1987 at Teshio-gun in Hokkaido. On June 29, 1989 (28 months old), it was transported to Farm-O in Chiba Prefecture and the farmer observed two blood spots (Fig. 1, a, b). On July 24, a blood spot (c) was observed and then the farmer informed the Clinical Center. On this day, the veterinarian recovered one female worm from the blood spot by surgical procedure, and also found 9 blood spot traces around the shoulder. On July 26, two additional blood spots were observed (Fig. 1, d, e), and the animal was given the oral treatment with IVM and also given topically with LEV. On August 12, 1989, a final blood spot was observed (Fig. 1, f), and the LEV was topically applied.

Case 2: This animal was born on July 12, 1987 at Esashi-gun in Hokkaido and was transported to Farm-K in Chiba Prefecture on June 29, 1989. On August 2, 1989 (25 months old), one blood spot (Fig. 1, g) and one blood spot trace were observed on the left shoulder. One female worm was detected from the blood spot and the animal was given the oral treatment with IVM. On August 22, 1989, two additional blood spots were observed (Fig. 1, h, i) and LEV topical treatment was applied. No lesions were observed on the right shoulder.

Both cattle remained healthy thereafter and both delivered normal calves on August 23, 1989.

Blood spots and worm: Blood spots were essentially in the form of nodules of about 10-15 mm in diameter, 2 mm in height, and the center of the spot had a tiny pore of approximately 1 mm in diameter. Intermittent bleeding took place from the pore. In morphological observation of the two worms received from blood spots, body lengths were 51.2 mm and 64.7 mm, and body widths in anterior and posterior were 0.48 mm, 0.44 mm and 0.21 mm, 0.20 mm, respectively. The mouth was simple and the esophagus was very short. The cuticle is transversely striated except at the anterior end. The esophagus is very short, not divided into 2 parts. The vulva was very close to the mouth, and eggs near the vulval opening contained larvae. The posterior end was bluntly rounded (Fig. 2). These characters were similar to those of Parafilaria bovicolia (Tubangui, 1934) described in Levine [3] and in Skryabin [8].

Chemotherapy: In the present trial, oral administration of IVM in both cases had no effect on the occurrence of the blood spots, because many spots were observed after

Table 1. Two cases of cutaneous hemorrhagic parafilaria in pregnant dairy cattle transported from Hokkaido to Chiba Prefecture

<table>
<thead>
<tr>
<th>Items</th>
<th>Case 1</th>
<th>Case 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>Teshio-gun</td>
<td>Esashi-gun</td>
</tr>
<tr>
<td>Date of birth</td>
<td>16Mar. 1987</td>
<td>28Jul. 1987</td>
</tr>
<tr>
<td>Date of transport</td>
<td>29June 1989</td>
<td>29June 1989</td>
</tr>
<tr>
<td>Clinical observation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date initial blood spot gen</td>
<td>26Jun. 1989</td>
<td>2Aug. 1989</td>
</tr>
<tr>
<td>(28 Ms. old)</td>
<td>(25 Ms. old)</td>
<td></td>
</tr>
<tr>
<td>Last observed hemorrhage</td>
<td>12Aug. 1989</td>
<td>2Aug. 1989</td>
</tr>
<tr>
<td>Total number of blood spots</td>
<td>15</td>
<td>4</td>
</tr>
</tbody>
</table>

Worm: P. bovicolia detected 1(female) 1(female)

Body length: 51.2 mm 64.7 mm
Anterior body width: 0.48 mm 0.44 mm
Posterior body width: 0.21 mm 0.20 mm

a) One worm was recovered by surgical procedure in both cases.
treatment. On the other hand, the LEV topical treatment resulted in drastic improvement. All bleeding from spots stopped completely within a few minutes after treated with LEV.

There are some reports on anthelmintic therapy of *P. bovicola* infections. Nitroximil administered once by subcutaneous injection at a dosage rate of 20 mg/kg body weight, provided for a reduction in the occurrence of blood spots [12]. However, efficacy of ivermectin against the worm was not confirmed. Subcutaneous injection of ivermectin at a dosage of 200 μg/kg had considerable effect in reduction the occurrence of blood spots [9], however, animals received the same dosage had a few number of worms with lesions at 15 and 30 days after treatment [10]. The same dose by oral administration led basically no reduction in the occurrence of blood spot [7]. The results of the present trial were similar to the report on effectiveness of IVM by oral administration.

A few reports of tetramisole efficacy in *P. bovicola* infection have been made. Tetramisole orally at 12 mg/kg for 5 day had effects to *P. bovicola* infections in cattle [2]. However, topical application of tetramisole or LEV in *P. bovicola* infections has not been recorded. Topical application of LEV solution in the present work was successful in stopping the bleeding. This method was very easy to use at the farm situation where cutaneous hemorrhagic parafilariais sporadically occurred.

The present outbreak and epidemiology of the infection resembled that described by Ishihara [1]. He suggested that the intermediate host of *P. bovicola* was distributed only on Hokkaido in Japan. In the present two cases, bleeding was observed within 0 or 34 days after the day of the transportation, although the prepatent period of *P. bovicola* was more than 184 days [5, 6]. The disease has not been found in cattle on the two farms or in the Chiba Prefecture on a whole since those cases in 1989. The two infections, as presented, have been undoubtedly acquired in Hokkaido. This is the second report of *P. bovicola* infection in Japanese cattle transported from Hokkaido to other prefectures.
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REFERENCES