Protection from Caseous Lymphadenitis in Sheep by Spraying Iodine Tincture on Shearing Wounds

Shin SERIKAWA, Shunsuke ITO, Tadao HATTAA, Naohito KUSAKARI, Kazuhiro SENNA, Takahihiro HIRAMUNE1), Naoya KIKUCHI1), and Ryo YANAGAWA1)
Takikawa Animal Husbandry Experiment Station, 735 Higashi-Takikawa, Takikawa, Hokkaido 073 and 1)Department of Epizootiology, School of Veterinary Medicine, Rakuno Gakuen University, Ebetsu, Hokkaido 069, Japan
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ABSTRACT. The effect of spraying shearing wounds with iodine tincture on Corynebacterium pseudotuberculosis infection in lambs was examined. The ELISA-negative lambs which had received some visible wounds during their first shearing were randomly divided into two groups: one was sprayed with iodine tincture on wounds after shearing, and the other was not. Anti-C. pseudotuberculosis toxin titers were measured by ELISA. The seroconversion ratio of the group with iodine tincture treatment 3 months after shearing was smaller than that of the untreated group (P<0.05). These results suggest that treatment of shearing wounds with iodine tincture is effective in the protection of C. pseudotuberculosis infection in lambs.—KEY WORDS: caseous lymphadenitis (CLA), iodine tincture spray, shearing wound.

The authors previously showed that the sheep positive in ELISA against Corynebacterium pseudotuberculosis toxin significantly increased in July, 3 months after shearing. Then it was emphasized that shearing wounds might play a major role in the occurrence of caseous lymphadenitis (CLA) in sheep [6].

To prevent ovine CLA, the following various procedures have been taken; practicing good sanitation around shearing and operations, culling sheep with enlarged lymphnodes, avoiding injuries, disinfecting shearing wounds, shearing in order of young sheep and moving newly sheared sheep to pasture immediately, etc. [1, 3-5]. Disinfection of shearing wounds seems to be effective in preventing CLA. No concrete evidence has, however, been given on its actual efficacy. This report deals with whether spraying iodine tincture on fresh shearing wounds prevents CLA.

Experiments were carried out on sheep of 2 farms in Hokkaido. One was the Takikawa Animal Husbandry Experiment Station (T farm) where 94 Suffolk lambs were born in spring, 1988 and the other was the Shibetsu sheep farm (S farm) with 47 lambs born in spring, 1989. These lambs at T and S farms were first sheared one year after birth, between April 18-21, 1989 and April 23-24, 1990, respectively. Of these 61 lambs from T farm and 33 from S farm, which were negative in anti-C. pseudotuberculosis toxin ELISA-titers at the time of shearing and received some visible wounds during shearing were used. The number of shearing wounds of these lambs ranged from 2 to 20, with an average of 5 to 6. Length of shearing wounds varied from several mm to about 10 cm, but in most cases were 2 to 5 cm in length. These lambs were randomly divided into two groups; 48 treated (32 from T farm and 16 from S farm) and 46 untreated (29 from T farm and 17 from S farm).

Iodine tincture was sprayed on all visible wounds immediately after shearing in the treated group, using a commercial spray (Canyon HI-SPRAYER; Canyon Co., Tokyo). The control group received no treatment.

Blood samples were collected from the sheep 5 to 9 days before shearing at T farm and just on the shearing day at S farm. The blood was sampled again 3 months later. Sera were stored at -20°C until tested.

The ELISA procedure to detect antibodies against the toxin antigen of C. pseudotuberculosis was the same as that followed by Chikamatsu et al. [2], and in our previous study [6]. The results were analyzed by the χ² test and Fisher's exact probability test.

Ten out of 48 (20.8%) sera in the treated group and 19 out of 46 (41.3%) in the untreated converted to positive by 3 months after shearing (Table 1). There was a significant difference, by the two analysis methods, between the two groups (P<0.05). In each farm the difference was not significant, but when the results of both were totaled the difference was significant. The ELISA positive ratios in lambs of both farms, before shearing, were almost equal; 11/94 (11.7%) in T farm and 5/47 (10.6%) in S farm. In addition, feeding and management systems, and shearing methods were almost the same on both farms. As the experimental conditions of the two farms were nearly equal, it was thought that totalizing the results of the 2 farms seems to be appropriate in the evaluation.

In the present experiment, iodine tincture spray on shearing wounds was found to be effective in protecting against CLA. About 20% of the treated sheep were, however, infected. One reason for the infection in the treated group may be that iodine tincture spray was applied only to visible wounds, but not to non-visible wounds. If the spray was applied to non-visible wounds too, the difference between the treated and untreated might be greater.

The present results furnish indirect evidence in support of an actual accepted idea that CLA is triggered by shearing wounds.

REFERENCES
Table 1. Effect of iodine tincture spray against CLA infection

<table>
<thead>
<tr>
<th>Farm</th>
<th>Iodine tincture spray</th>
<th>No. of lambs tested</th>
<th>ELISA-positives at 3 months after shearing (%)</th>
<th>Significant difference between</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>+</td>
<td>32</td>
<td>9(28.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>29</td>
<td>15(51.7%)</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>+</td>
<td>16</td>
<td>1(6.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>17</td>
<td>4(23.5%)</td>
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</tr>
<tr>
<td>Total</td>
<td>+</td>
<td>48</td>
<td>10(20.8%)\textsuperscript{a}</td>
<td>A and B</td>
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<tr>
<td></td>
<td>-</td>
<td>46</td>
<td>19(41.3%)\textsuperscript{b}</td>
<td>(P&lt;0.05)</td>
</tr>
</tbody>
</table>
