Scientific Report

The effect of imidocarb dipropionate on babesiosis in sheep

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Summary
Thirty four cases of babesiosis in sheep were diagnosed on the basis of clinical and laboratory findings. Eighteen of these sheep were infected by Babesia ovis, 14 by Babesia motasi and 2 had mixed infection of both of the species. The affected animals were treated with Imidocarb dipropionate at the dose rate of 1.2mg/kg body weight. One to two weeks later the animals were examined for any signs of disease. Imidocarb administration cured 94.4% of sheep infected with B. ovis and 78.5% of those infected by B. motasi. Three animals with severe anemia and high fever showed signs of drug toxicity.

Key words: Babesia ovis, Babesia motasi, Imidocarb, Sheep

Introduction
Babesiosis in sheep is a tick-borne disease caused by the hemoproteozoan parasites, Babesia ovis and Babesia motasi. The disease is widely distributed in Africa, Asia and Europe and causes great economic losses (Habela et al., 1990; Scott, 1991). Babesiosis due to B. motasi is serious and frequently fatal in the acute form; introducing a higher rate of parasitemia, while B. ovis infection shows less severe disease with a lower parasitemia (Shah-Fischer and Say, 1989; Soulsby, 1982). A number of drugs have been used to treat babesiosis in different animals. Imidocarb dipropionate, a carbanilide derivative is active against many species of Babesia in cattle and it also exerts a prophylactic effect against Babesia infections in cattle, mice and rats (McDougald and Robertson, 1988; McHardy, 1983).

A few reports have been made regarding the effectiveness of Imidocarb in treatment of experimental and/or natural cases of B. ovis infection (Hashemi-Fesharaki, 1991; McHardy et al., 1986). On the other hand no reports are available for efficacy of Imidocarb against B. motasi infection in sheep.

Materials and Methods
During spring and summer of 1999, 34 cases of babesiosis were diagnosed in sheep in our Clinic. Diagnosis of the disease was based on the clinical signs including depression, high fever, anemia and dyspnea; and identification of piroplasms of Babesia in peripheral blood smears stained by Giemsa's method. There were 18 cases of B. ovis, 14 of B. motasi and 2 of concurrent infection with the both Babesia species. Blood samples were collected from affected animals for packed cell volume (PCV) determination.

Imidocarb dipropionate (Imizol; Pitman-Moore) was used for treatment of infected animals as a 12% aqueous solution. The
drug was injected intramuscularly at a dose of 1.2mg/kg body weight. Treated animals were kept for 1 hour after drug administration to detect any adverse reactions and they were clinically examined 7-14 days later for any signs of the disease. Statistical analysis for detection of any significant differences in PCV and result of treatment of sheep infected with 2 species of Babesia was done using Chi-square test and P<0.05 considered as significant.

Results
Sheep infected with B. ovis and or B. motasi showed moderate to severe anemia (Table 1), however there was no significant difference in PCV between 2 groups of animals (P>0.05). The efficacy of Imidocarb dipropionate in treatment of B. ovis and B. motasi infection in sheep is showed in Table 1. Imidocarb dipropionate at a dose rate of 1.2mg/kg body weight cured 94.4% of animals infected with B. ovis and 78.5% of animals infected by B. motasi. Statistical analysis showed no significant difference in the effects of drug in controlling of two species of Babesia infection in sheep (P>0.05). One of two sheep with mixed infection of B. ovis and B. motasi died 3 days after drug administration.

Signs of drug toxicity such as salivation, incoordination and sweating were observed in 3 sheep 10-30 minutes after injection of Imidocarb. These animals had a high fever and evidence of severe anemia due to B. ovis infection. The adverse reactions were controlled by an intravenous administration of atropine sulfate at a dose rate of 0.04mg/kg body weight.

Discussion
The findings of the present study showed that Imidocarb dipropionate with a dose of 1.2mg/kg body weight can be effective in treatment of natural cases of babesiosis due to B. ovis or B. motasi infection in sheep. These results are more or less in corroboration with reports of Hashemi-Fesharaki, (1991) who cured all field cases of B. ovis infection in sheep and goats with Imidocarb dipropionate. B. motasi is a large Babesia and resembles B. bigemina in cattle (Shah-Fischer and Say, 1989; Soulsby, 1982). Imidocarb dipropionate is very effective in treatment and/or sterilizing B. bigemina infection in cattle (McHardy and Simpson, 1974). B. caballi, a large Babesia in horses also is responsive to chemotherapy with Imidocarb (McDougald and Roberson, 1988). Babesiosis in sheep caused by B. motasi infection also is more severe than the disease caused by B.ovis infection (Shah-Fischer and Say, 1989; Scott, 1991). In our study sheep infected with B.motasi showed lower PCV than sheep infected with B.ovis although this was not statistically significant (P>0.05).

Morbidity and mortality rates of babesiosis in sheep can be high and up to 40% of untreated animals may die from anemic anoxia (Smith and Sherman, 1994; Scott, 1991). In experimentally induced Babesiosis in lambs, all untreated animals died following development of severe disease (McHardy et al., 1986).

Although no signs of toxicity were reported by McHardy and his colleagues (1986) following intramuscular injection of 1.2mg/kg body weight of Imidocarb.

<table>
<thead>
<tr>
<th>Babesia species</th>
<th>sheep No.</th>
<th>PCV value%</th>
<th>recovery No.(%)</th>
<th>died No.(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. ovis</td>
<td>18</td>
<td>22.9±5.4</td>
<td>17(94.4%)</td>
<td>1(5.6%)</td>
</tr>
<tr>
<td>B. motasi</td>
<td>14</td>
<td>19.1±4</td>
<td>11(78.5)</td>
<td>3(21.5%)</td>
</tr>
</tbody>
</table>

Table 1: The PCV values and result of treatment of sheep naturally infected with Babesia species by Imidocarb dipropionate
درمان بازیوز گوسفندهای ماده و دختر حیب الله سلجوقی

دربررسی اثرات دی پروپیونات ایمیدوکارب در درمان بازیوز گوسفند

ارزیابی اثرات دارو مورد ممانعت دریافت گوسفند. تزریق دارو

آزمایشگاهی بازیوز ناشی از باربیتات/اورباس و

ورود به بازیوز مبتلا را درمان نمود. نتایج نشان داد که تریک دارو

بلهداشت و کم خونی شدیدی را نشان می‌دادند.

متوقف تزریق دارو علائم مسمومیت را روز داد.

ویژه‌های کلیدی: بازیوز/اورباس

ایمیدوکارب/گوسفند

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