Interference of Bovine *Fasciola hepatica* on the Tuberculin Intradermal Test Reaction

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Introduction

During the present tuberculosis eradication program in Italy, the Ministry of Health requests the intradermal test to identify positive subjects to the tuberculin test in cattle. The intradermal-reaction may give false positive reactions in healthy subjects, for example, during some parasitic disease.[2,4,7]

Personal Observations

We have made our researches in dairy an official brucellosis-free and tuberculosis-free dairy herd located in Lombardy (a region of north Italy), for 3 years. The herd was composed of 113 cows, 90 steers and 28 calves over 3 years old. Cows and steers were fed hay, cut up maize and fodder, and also grass during spring and summer.

231 head of cattle were inoculated with tuberculin PPD to get legal certificate of indemnity for the herd. We found positive reactions in 12 cows and 1 steer with local feebly, painful and warm swelling (between 8 and 18 mm) and 15 steers with doubtful reactions (Table 1). In all 28 head of cattle local lymph nodes were normal and there were no general symptoms.

Table 1: Number and percentage of cattle with negative, positive and doubtful reaction to bovine PPD Tuberculin.

Cattle		Reaction					
		Negative		Positive		Doubtful	
		N	%	N	%	N	%
Cows	113	101	89.4	12	10.6	0	0
Steers	90	74	82.3	1	1.1	15	16.6
Calves	28	28	100	0	0	0	0
Total	231	203	87.8	13	5.6	15	6.4

We decided to slaughter 2 of the positive subjects (1 cow and 1 steer) for post-mortem examination to find any possible tuberculous lesions. Necropsy gave negative results to tuberculous lesions, but highlighted hepatic damage, cirrhosis and chronic catarrhal angocolilithiasis caused by past larval migrations of *Fasciola hepatica.*

The remaining 26 head of cattle with positive or doubtful reaction were isolated.

Two months later, we made a further intradermal test in all 229 head of cattle in the herd and the comparative test with avian PPD tuberculin in the 11 previous positive ones.

The Results Showed

- 8 out of 15 steers with previous doubtful reaction again doubtful
- 3 of the cows tested with avian PPD tuberculin with doubtful reaction and 8 with negative reaction (Table 2). This group was slaughtered and at post-mortem examination they did not show any lesions for tuberculosis but showed lesions caused by *Fasciola hepatica.*

Table 2: Local reaction in cattle after the comparative test with bovine PPD and avian PPD Tuberculin.

Cattle No.	Thickness of Skin In mm.			Reaction
	Bovine PPD	Avian PPD	Difference	
1	10	8	2	N
2	11	10	1	N
3	8	7	1	N
4	13	11	2	N
5	13	10	3	D
6	9	8	1	N
7	10	8	2	N
8	11	8	3	D
9	12	10	2	N
10	14	11	3	D
11	10	9	1	N

Legend: N = Negative; D = Doubtful

On the basis of:

- anamnestic data (closed breeding officially tuberculosis-free and brucellosis-free for 10 years)
- epizootologic data (herd situated on an area without tuberculosis cases for many years)
- clinical data (all subjects were without clinical signs of tuberculosis)
- post-mortem examination data (absence of tuberculous reports and presence of *Fasciola hepatica* in all slaughtered 13 subjects)

we formulated the hypothesis that the positive reactions observed in the 13 cattle could have been due to a parallergic phenomenon caused by atypical Mycobacteria carried by larvae of Distoma such as Meyer (1963), Hejj (1969) and Zorawski (1988) observed. We decided to treat against *Fasciola* and its larvae all the steers over 1 year old and all the drying off cows with just one dose of rafoxamide (10 mg/Kg).

Before and after the treatment we made a fecal examination of all the herd to evaluate the prevalence of infestation and the results of treatment (Table 3).

One year after the anthelmintic treatment, we made the third tuberculin test that gave 5 positive cows and 7 doubtful steers.

Table 3. Results of fecal examination for eggs of *Fasciola hepatica*

	No. of Cattle	Positive	%
Before Treatment	198	136	68.6
After 1 Treatment	201	81	40.2
After 2 Treatments	202	7	3.4

Positive local reactions were characterized by cold and painless swelling (5-6 mm).

Two of 5 positive cows were slaughtered and post-mortem examinations again showed lesions caused by *Fasciola hepatica*. We decided to repeat the therapy with rafoxamide and also to prevent the infection giving only dry fodder even in summer. Fecal examination made after the second treatment showed that the percentage of positives was reduced to 3.4% (Table 3). One year after the second treatment, all the cattle were subjected to a fourth tuberculin test. The test showed no positive subjects and only 3 cows with doubtful reaction with 2.5 mm of swelling.

Discussion

Sometimes in cattle, *Fasciola hepatica* can cause false positive reactions to the tuberculin test. It is possible that metacercaria can carry some saprofitic mycobacteria present in the intestinal tract which are able to cause heterospecific reactions. Following our researches we feel that occasional treatments with anthelmintics might not be effective to avoid the parallergic reactions. In accordance with Quarante (1970) we consider that only medical and food prophylaxis against *Fasciola hepatica* could limit this type of reaction in cattle.

References

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