

USE OF THE METAL DETECTOR TO DETERMINE THE PREVALENCE OF METALLIC FOREIGN BODIES IN DAIRY COWS IN ARAÇATUBA REGION, BRAZIL.

UTILIZAÇÃO DO DETECTOR DE METAIS PARA A DETERMINAÇÃO DA PREVALÊNCIA DE CORPOS ESTRANHOS METÁLICOS EM BOVINOS DE RAÇAS LEITEIRAS NA REGIÃO DE ARAÇATUBA-BRASIL

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RESUMO

Com os objetivos de determinar a prevalência de corpos estranhos metálicos nos animais de rebanhos da região de Araçatuba-Brasil, verificar a presença de animais com reticuloperitonite traumática nestes rebanhos e correlacionar a presença de sinais clínicos de reticuloperitonite traumática à positividade quando da avaliação pelo detector de metais, foram pesquisados 138 animais adultos, sendo 48 animais na propriedade 1, sendo 24 animais positivos à passagem do detector de metais, 32 animais na propriedade 2, nenhum positivo, 28 animais na propriedade 3 sendo 3 positivos e 30 animais na propriedade 4 sendo 7 animais positivos. Sangue de 11 animais foram colhidos para a realização de hemograma, porém nenhum deles apresentou alteração. Podemos concluir que a utilização do detector de metais como auxiliar de diagnóstico é de fundamental importância, pois permite um diagnóstico mais precoce o que diminui os gastos e melhora a chance de sucesso no tratamento e que propriedades melhores manejadas tem menor incidência de ingestão de corpos estranhos metálicos e portanto menor probabilidade da ocorrência da doença.

PALAVRAS-CHAVE: Bovinos. Reticuloperitonite. Reticulopericardite. Corpo estranho.

SUMMARY

To determine the prevalence of metallic foreign bodies in animals from flocks in the region of Araçatuba-Brazil, to verify the presence of animals with traumatic peritonitis and if there a correlation between the presence of clinical signs with a positive result on the metal detector exam. 138 adult dairy cows from four farms were used: 48 animals from property 1 with 24 found positive on the metal detector exam, 32 animals from property 2, with no positive results, 28 animals in property 3, with 3 positives and 30 animals in property 4, with 7 animals positive. Blood of 11 positive animals was collected for the hemogram, however none of them showed any changes. We can conclude that the use of the metal detector as an auxiliary diagnostic test is of extreme importance, since it allows an earlier diagnosis which diminishes the expenses and improves the possibility of success of the treatment and that animals from properties with good management practices have a minor incidence of ingestion of metallic foreign bodies, therefore a lesser probability of occurrence of the disease.

KEY-WORDS: Bovine. Reticuloperitonitis. Reticulopericarditis. Foreign body.

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STUDY

Traumatic reticuloperitonitis, also known as hardware disease, is one of the most ancient diseases in cows, but still occurs with alarming frequency, even with the modern practices of animal management (REBHUN, 1995). It is usually caused when foreign linear objects, such as needles and fencing wires, are ingested by animals leading to the perforation of the reticulum and resulting in the contamination of the body cavities and organs (HOWARD, 1999). Dairy cows are more affected than beef cattle and, mainly, animals in advanced stage of gestation or recent parturition (RADOSTITIS et al., 2002). Foreign bodies are found in the reticulum of cows many times without causing consequences, since lesions with intramural penetration without disruption of the serosa are, many times, asymptomatic or result in self-limiting disease. In industrialized countries, metallic foreign bodies are present in the reticulum in more than 90% of healthy animals (MARQUES et al., 1990) and scars in the reticulum wall or evidence of adhesion due to the disease are found in more than 7% of adult dairy cows during *post mortem* exam (HOWARD, 1999). Variable prevalence of lesions caused by foreign bodies, from 7% to 21% have been described (CRAMERS et al., 2005). The metal detector is an important auxiliary test, which has been used because it is a non-invasive, fast and cheap test. However, it does not determine if the foreign bodies are sharp or if they are really perforating the reticulum wall (REBHUN, 1995). In one study, the presence of metallic foreign bodies was detected in all animals by a metal detector, but some normal animals were also positive to the test (RAMPRABHU et al., 2003). The metal detector has also been used in other species. Cisale et al. (1993) recommend the use of metal detector as a supplement in the field for the detection of metallic foreign bodies because its use, in association with the history and clinical signs, allowed the preliminary diagnosis of a perforating foreign body in the ventriculus. Schalamon et al. (2004) reported a sensitivity and specificity of 100% regarding the

detection of metallic foreign bodies in the stomach of children and concluded that when a metallic foreign body is identified by the metal detector, additional radiological confirmation is not required.

To determine the prevalence of metallic foreign bodies in animals from flocks in the region of Araçatuba-Brazil, to verify the presence of animals with traumatic reticuloperitonitis and if there is a correlation between the presence of clinical signals of traumatic reticuloperitonitis with a positive result on the metal detector exam.

138 adult dairy cows from four farms were used: 48 animals from property 1, 32 animals from property 2, 28 animals from property 3 and 30 animals from property 4. Property 2 is a dairy farm that produces milk type A and the others produce milk type C. All cows in lactation of each property were clinically examined (respiratory and heart rates, rectal temperature, and other clinical parameters when necessary). After the clinical examination, the metal detector (Ferrooskop 3 - H. Hauptner und Richard Herberholz GmbH - Solingen - Germany) was applied over the ventral and ventrolateral parts of chest and abdomen to detect a metallic foreign body, from the fifth to the seventh intercostal space. Those animals with a positive response to the metal detector were submitted to the positive pain response tests.

In property 1, 24 animals were found positive (table 1), and blood of 6 positive animals in this property was collected for the hemogram, however none of them showed any changes. In property 2, there was no positive animal to the metal detector test. In property 3, 3 animals were positive to the metal detector and in property 4, 7 animals were positive to this test and blood of 5 animals were collected for the evaluation of the hemogram which did not show any changes. The majority of the positive animals to the metal detector did not show any clinical signals of reticuloperitonitis, emphasizing that this test should be used when the clinical signals lead to the suspicion of the presence of sharp metallic foreign body, which makes possible to establish a diagnosis in these cases.

Table 1 – Heart rate (Bpm), Respiratory rate (Mpm) and site of positive signal to metal detector test in animals from farm 1 – Araçatuba – SP – 2006.

Animal ID	Age (years)	HR	RR	Type and site of response to metal detector test
Balisa	5	104	48	Positive to metal detector , over the xiphoid
Dobrada	6	60	52	
Gaúcha	5	88	44	
Chupeta	4	152	48	Positive to metal detector , 3 cm caudal to xiphoid
Feiticeira	4	84	36	Positive to metal detector, 4 cm caudal to xiphoid
Baronesa	5	124	30	Positive to metal detector , 5 cm caudal to xiphoid
Carina	4	108	32	
Sabiá	5	98	36	Positive to metal detector , 6 cm caudal to xiphoid
Serenata	5	108	48	
Gemada	4	96	16	Positive to metal detector , 8 cm caudal to xiphoid
Bordada	5	72	20	Positive to metal detector , 10 cm caudal to xiphoid
Amorosa I	4	68	28	
Castanhola	5	88	20	
Araponga	6	164	24	
Guairá	5	100	28	
Conquista	3	108	36	
Luar	3	120	24	
Dita	5	80	16	
Bonita	5	88	24	Positive to metal detector , 20 cm caudal to xiphoid Anorexic. Positive to pain test
Faisca	4	116	32	Positive to metal detector , 30 cm caudal to xiphoid
Guitarra	5	84	20	Positive to metal detector , 40 cm caudal to xiphoid
Corujinha	4	84	40	
Sereia	6	88	40	
Cheirosa	3	100	48	

CONCLUSION

We can conclude that the use of the metal detector as an auxiliary diagnostic test is of extreme importance, since it allows an earlier diagnosis which diminishes the expenses and improves the possibility of success of the treatment and that animals from properties with good management practices have a minor incidence of ingestion of metallic foreign bodies, therefore a lesser probability of occurrence of reticuloperitonitis/reticulopericarditis.

REFERENCES

- CRAMERS, T. et al. New types of foreign bodies and the effect of magnets in traumatic reticulitis in cows. *Veterinary Record*, v.157, p. 287-289, 2005.
- FEITOSA, F. L. F. **Semiologia veterinária: a arte do diagnóstico**. São Paulo: Roca, 2004. p.123-124.
- HIRVONEN, J., PYORALA, S. Acute-phase response in dairy cows with surgically-treated abdominal disorders. *Veterinary Journal*, v.155, n.1, p. 53-61, 1998.

HOWARD, J. L. (Ed.) **Current veterinary therapy: food animal practice**. 3rd. ed. Philadelphia: W. B. Saunders, 1993. p.686-687; 719-722.

HOWARD, J. L., SMITH, R. A. (Ed.) **Current veterinary therapy: food animal practice**. 4th. ed. Philadelphia: W. B. Saunders, 1999. p.478-479; 514-517.

JAIN, N. C. **Essentials of veterinary hematology**. Philadelphia : Lea & Febiger, 1993. p.417.

KRUTWALD-JUNGHANNS, M-E et al.. Surgical removal of ventricular foreign bodies from an adult ostrich (*Struthio camelus*). **Veterinary Record**, v145, p. 640-642, 1999.

MARQUES, L.C. et.al. Estudo das alterações clínicas, hematológicas, eletrocardiográficas e anatomopatológicas de bovinos portadores de retículo pericardite traumática, **Ars Veterinária**, v.6, n. 2, p.100-111,1990.

MARTINS, A. M. C. R. P. F. et al. Presença de corpos estranhos no aparelho digestório dos bovinos. **Arquivo do Instituto Biológico**, v.71, n.1, p.83-87, 2004.

RADOSTITS, O. M. et al. **Clínica veterinária: um tratado de doenças dos bovinos, ovinos, suínos,**

caprinos e eqüinos. 9. ed. Rio de Janeiro: Guanabara Koogan, 2002. p.274-281.

RAMPRABHU, R. et al. Comparative efficacy of diagnostic tests in the diagnosis of traumatic reticuloperitonitis and allied syndromes in cattle. **Israel Journal of Veterinary Medicine**, V. 58, n. 2-3, 2003.

REBHUN, W. C. **Diseases of dairy cattle**. Baltimore: Williams & Wilkns, 1995. p.44-46; 113-116.

SEMRAD, S. D. Mastitis, metritis, traumatic reticuloperitonitis and suspected fungal rumenites in a cow. **Journal of the American Veterinary Medical Association**, v.203, n.10, p.1404-1410, 1993.

SCHALAMON, J. et al., The use of a hand-held metal detector for localization of ingested metallic foreign bodies – a critical investigation. **European Journal of Pediatrics**, v. 163, p. 257-259, 2004.

SMITH, R. D. Decision analysis in the evaluation of diagnostic tests. **Journal of the American Veterinary Medical Association**, v.203, n.8, p.1184-1192,1993.

YOSHIDA, Y. Eletrophoretic studies on serum proteins in cows with traumatic pericarditis. **Journal Veterinary Medical Science** v.53, n.1, p.5-11, 1991.