

Sudden Death of Three Calves Within Two Weeks of Vaccination and Castration—A Practitioner Case Report

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Abstract

Three male beef calves, 3-4 mo of age, died a few days after vaccination and castration. Because the pasture had been used several years without incident by the producer for calving, environmental causes were low on the differential diagnosis list. Because there was not an opportunity to examine the calves ante-mortem and necropsy findings were unremarkable, the practitioner relied on the producer's description of clinical signs, then worked with the producer and pathologist to reach a definitive diagnosis of lead poisoning. The blood lead level in one calf that died was 4.3 ppm, and the kidney lead level was 101 ppm. Economic concerns were compounded due to potential exposure of a number of cows in the first trimester of pregnancy.

Résumé

Trois veaux de boucherie mâles, âgés de 3-4 mois, sont morts quelques jours après la vaccination et la castration. Parce que le pâturage avait été utilisé pendant plusieurs années par le producteur pour le vêlage, les causes environnementales ne comptaient pas pour beaucoup dans la liste du diagnostic différentiel. Comme un examen ante-mortem n'avait pu prendre place et que les résultats de la nécropsie n'étaient pas révélateurs, le vétérinaire a dû prendre en ligne de compte la description des signes cliniques offerte par le producteur et travailler de concert avec le producteur et le pathologiste pour en arriver à un diagnostic final d'empoisonnement au plomb. Le niveau de plomb dans le sang de l'un des veaux était de 4.3 ppm et le niveau rénal était de 101 ppm. L'intérêt économique était accru à cause de l'exposition potentielle de plusieurs vaches dans le premier trimestre de la gestation.

Introduction

The most accurate and timely diagnosis of disease is made with the combination of a complete history, physical or herd examination and laboratory results. With some conditions, a definitive diagnosis is

difficult to make if one of the key elements is missing or provides insufficient or incorrect information. This report describes a case where the history and lack of opportunity to examine live, affected calves made the diagnosis challenging.

History and Clinical Findings

Thirty-two cow-calf pairs were kept in a bromegrass pasture where cows had calved for several years without problems. When the calves were 3-4 months of age, the owner vaccinated them with a 7-way clostridial bacterin-toxoid and an intranasal IBR-PI₃ vaccine, and the bull calves were castrated. To castrate the bulls, the bottom of the scrotum was removed with a knife and the testicles were removed with traction. Three days after processing, one calf died, but necropsy was not requested. Two days later, the producer reported a second calf had died after showing clinical signs of stiffness, blindness and incoordination. The calf was brought into the veterinary clinic for post-mortem examination 36-h after death, but no gross pathologic signs were noted due to advanced autolysis. The attending veterinarian considered tetanus as the primary differential diagnosis due to recent castration and verbal history from the owner. The remaining calves were administered tetanus antitoxin.

The producer called a week later to report a third calf, with no previous clinical signs, was down and kicking. When the veterinarian arrived at the farm, the calf was dead.

Necropsy Findings

The 175 lb (80 kg) Angus steer calf was in good body condition and showed no external signs of disease, such as scours, bloat or trauma. On post-mortem examination, the lungs and heart were grossly normal, however, the pericardial sac contained 15 ml of gold, clear fluid. Hemorrhage was present in the left ventricle, involving the cardiac muscle to a depth of 2-3 mm. Skeletal musculature was grossly normal. Extensive hemorrhage was noted in the retroperitoneal area extending

from above the bladder to just caudal to the kidneys. Fresh and fixed kidney, liver and heart, as well stomach content and clotted blood, were collected and submitted to the Kansas State University Veterinary Diagnostic Laboratory. Differential diagnoses included acute clostridial disease, *Haemophilus somnus*, tetanus, septicemia and undefined toxicity.

Laboratory Data

Histopathology findings were unremarkable and no significant bacteria were isolated from the tissues. The attending practitioner consulted with the pathologist, reviewed the history, and requested that blood and tissue lead levels be determined. The blood lead level was 4.3 ppm (toxic level > 0.4 ppm),³ and the kidney contained 101 ppm lead (toxic > 30 ppm).² Based on this, a diagnosis of lead poisoning was made.

Discussion

The diagnosis of lead toxicity was promptly reported to the producer, and the cattle were removed from the pasture until the source of lead was found. A single lead-acid automobile battery, previously used for an electric fence charger, was located and removed. No further cases occurred. The producer was concerned about the impact of lead on early pregnancies because a large percentage of cows in the herd were in the first trimester of pregnancy, and lead is known to cross the placental barrier.² Follow-up a year later on this group of cows did not reveal any abnormal pregnancy loss or above average calf mortality.

Clinical signs of lead toxicity usually include blindness, ataxia, depressed sensorium, normal pupillary light responses, episodic running, hyperesthesia, bellow-

ing, salivation, bloat and diarrhea.^{1,2} Nursing calves are more likely to be affected due to the correlation of the vitamin D and milk enhancing lead absorption.² Sources of lead commonly include paint, used motor oil, linoleum, roofing felt, machinery grease, caulking, arsenic defoliants and lead-acid batteries.

Conclusion

This case was of particular interest because no live calves with clinical signs were seen by the veterinarian, and the case was resolved solely on history, post-mortem examination and diagnostic laboratory results. The complete history provided by the producer, plus team communication with both the producer and pathologist, were key to reaching a definitive diagnosis. The short-term duration of clinical signs and sudden death of the third calf was atypical of lead toxicity. Moreover, the potential for economic impact included not only the loss of calves, but also the effect on early pregnancy.

Acknowledgement

Special thanks to Jerome Nietfeld, DVM, PhD, Kansas State University, for his assistance on the case.

References

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