

Clinical Report - Atypical Rabies in a Cow

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Abstract

A six year old cow with decreased appetite and a stiff gait of seven days duration was examined by its owner and veterinarian. Clinical signs were non-specific and a definitive diagnosis was not made. The cow died 19 days after first being noticed as ill. Because of a previous news story about rabies, the owner had the cow's brain tested for rabies and it was positive. The owner underwent post-exposure prophylaxis.

The news story about rabies was effective in educating the public about rabies. However, continuing education may be necessary to improve the veterinarian's understanding of the pathogenesis and epidemiology of rabies in cattle.

Case History

The owner of a 200 head purebred cow herd in north central North Dakota had observed that a six year old cow in the herd had a decreased appetite and a stiff gait during the previous seven days. Physical examination by the owner revealed no remarkable clinical signs except that the animal was "not quite doing right." The rancher treated the animal with 2 gm of oxytetracycline IM and 193 gm of sulfamethazine PO. That same day the cow was placed in a separate pen by itself to be fed and watered by hand.

That evening the rancher visited with his neighbor about the cow. The neighbor reported that earlier in the evening the local television station aired a news story about rabies within the state.

On the eighth day of illness, the rancher took the cow to veterinarian A to be examined for possible rabies. On physical examination the cow was gaunt, salivating, and had a rectal temperature of 104.1 F (40.0 C). No obstruction or oral erosions were visible within the cow's mouth. Rectal palpation revealed no abnor-

malities except pain around the kidney area. Intestinal motility was reduced and the stool was scant and mucous covered. Because of the elevated rectal temperature and clinical findings, veterinarian A did not believe the clinical signs were consistent with rabies, but did not rule it out. Veterinarian A treated the cow with 4 L of mineral oil PO, 16 oz of magnesium hydroxide in 4 L of water PO, 8 gm of oxytetracycline IM and 20 ml of vitamin B complex IM. The cow was returned to the ranch. On the ninth day of illness, the cow drank 3 gallons of water but consumed very little feed.

On day eleven, veterinarian A rechecked the cow at the ranch. The owner reported that the cow was eating and drinking very little. Physical examination revealed a basketball-sized area of pitting edema in the vicinity of the brisket. The rectal temperature was 104.8 F (40.4 C). The cow was treated for possible traumatic reticuloperitonitis with 1200 grains of acetylsalicylic acid PO, 6,000,000 units of penicillin G procaine IM, and a magnet PO. On the twelfth day of illness the cow stopped eating and her condition continued to deteriorate.

On the seventeenth day of illness the cow stopped drinking and died on day 19. Being curious, the rancher performed a postmortem examination to check if the animal had traumatic reticuloperitonitis. He did not present the carcass to a veterinarian for necropsy. The rancher found the previously mentioned magnet, but in his opinion there were no other gross abnormalities. The cow was dragged to a pit to be buried. Because of concerns raised by the newscast about rabies, the rancher later returned to the pit and removed the cow's head.

The rancher stored the cow's head in his basement and in the trunk of his car until he delivered it to veterinarian B for rabies tests. This was on day 21 following onset of illness. The rancher asked veterinarian B if he thought the cow had rabies. Veterinarian B indicated rabies could not be ruled out, but that the duration of the illness and the clinical history, including the elevated

rectal temperature, decreased the likelihood of rabies. The following day veterinarian B submitted the cow's brain to the Division of Microbiology, North Dakota Department of Public Health (ND DOH) for rabies testing. Twenty-three days after the cow was noticed sick and four days following the animal's death, the ND DOH reported that the submitted tissue was positive by the direct fluorescent antibody test for rabies. That evening the rancher started post-exposure prophylaxis (PEP).

Discussion

Rabies is an acute, almost invariably fatal viral encephalomyelitis caused by a virus belonging to the genus *Lyssavirus* that can be acquired through contact with virus-laden saliva from a rabid animal.³ In 1997, four humans died of rabies in the United States, all from a bat variant of rabies virus.⁴ Bovine rabies was associated with at least one human death in the United States in 1938, although more recent cases have been reported in Europe^{6,10} and Latin America.⁹ From 111 to 1012 annual cases of bovine rabies were confirmed in the United States between 1938 and 1996, with a median of approximately 398 per year. The maximum number of reported cases was reached during the 1950's, when dog rabies was enzootic, with a steady decline thereafter. Minor peaks were observed during 1967, 1972, and 1981, closely corresponding to the distribution of skunk rabies outbreaks in the north central and south central United States.⁷ Less than 200 cases per year of bovine rabies have been reported nation wide over the last 5 years. Between 5 and 12 cases per year were reported in North Dakota during the same period.

In general, rabid animals tend to shed virus in their saliva during or shortly before clinical signs of disease appear. Thus, if a human is bitten or exposed to saliva from a suspected rabid dog, cat, or ferret, a ten day confinement and observation period is routinely recommended⁵ because laboratory and epidemiologic studies have specifically determined that these animals tend to die of rabies within the prescribed observation period. This is not necessarily the case for other species in which the shedding time of the rabies virus is unknown. For example, this case report exemplifies the variability in clinical signs of bovine rabies as compared to rabies in dogs, cats, and ferrets. The cow exhibited non-specific signs for 19 days before dying of rabies. Because the cow was ill six days before being put into a separate pen and the pen may not have been vermin proof (i.e. skunks), it is possible that the cow had multiple medical problems not detected when clinically examined, that rabies was unrelated to the presenting complaint, and that the clinical course for rabies could have been less than 19 days.

The range of clinical signs in bovine rabies can be quite broad and non-specific. These can include fever,

lethargy, anorexia, hyperaesthesia, tremors, bellowing, head pressing, excessive salivation, aggression, opisthotonos, tenesmus, trismus, ruminal stasis, priapism, incoordination, ataxia, paresis, paralysis, prostration, apnea, and terminal paroxysms, as recently reviewed.⁸ The incubation period for rabies in cattle is extremely variable with reports from 20 to 150 days reported.² Illness in cattle usually lasts two to five days before death of the animal, but can occasionally extend to 8 to 10 days.¹ The cow in this case report survived much longer.

The importance of educating the public about rabies cannot be overemphasized. This rancher was exposed to the rabid cow 13 days before the animal died, and he did not start rabies PEP until 17 days from his first exposure to the rabid animal. As emphasized in this case report, the media can be an effective way to inform the public of the dangers of rabies. Even when rabies was not a likely diagnosis, the rancher still kept the previously mentioned news story about rabies in mind. Clearly, the informed client is the best client.

Conclusions

The importance of including rabies as part of any differential diagnosis when animals exhibit non-specific clinical signs, as in this case report, should be obvious. Veterinarians working in public health, extension, and regulatory medicine should regularly produce news releases, video and audio public service announcements, and other continuing education materials which target practicing veterinarians and producers to continually remind them about rabies and the variability of clinical signs in domestic animals, other than dogs, cats, and ferrets.

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