

Aujeszky's Disease

Outbreak on an Iowa farm

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Because of their rapid development and rare occurrence, certain diseases are difficult to diagnose. Often the anamnesis of such cases is lacking because the owner does not observe anything before he finds that one or more animals in the herd has succumbed. Such cases of rare diseases in a community are puzzling to the owner as well as to the veterinarian. Furthermore, it is probable that a rare enzootic may easily escape attention because of failure of a diagnosis. Aujeszky's disease falls into this category since it is sporadic in occurrence, concealed in its development, and of short duration before death ensues in the affected animals. In species such as the pig, the course of the disease may be insidious and the recovery uneventful.

Following Aujeszky's report of the existence of the disease in cattle, dogs, and cats in Hungary in 1902,¹ numerous records of the disease in that country and reports of the occurrence in other parts of the world have appeared. Most outbreaks, however, have been sporadic with only a few animals apparently being affected. For a comprehensive review on the subject, the reader is referred to Galloway,⁴ and Hutyrá and Marek.⁵

Occurrence

The occurrence of the virus of Aujeszky's disease has been reported under various names, and the common synonyms given are: "pseudorabies," "infectious bulbar paralysis," and "mad itch," the later under which it was first reported by Shope¹¹ in this country. Most authorities agree that the infectious agent reported under the various synonyms is identical with the virus of Aujeszky. Another outbreak of Aujeszky's disease in America was reported by Morrill and Graham.⁷ At the Veterinary Research Institute, Iowa State College, the virus has been recovered from cattle and swine by McNutt⁶ in several cases.

The virus of Aujeszky's disease has been found to infect dogs, cats, cattle, swine, sheep, horses, and rats under natural conditions. Experimentally, the

disease has been produced by inoculation or feeding in rabbits, cats, dogs, guinea pigs, rats, mice, pigs, sheep, cattle, goats, horses, asses, foxes, hedgehogs, monkeys, porcupines, opossums, pigeons, geese, ducks, sparrowhawks, and domestic fowl.

Outbreak Investigated

Recently, an outbreak which was finally diagnosed as Aujeszky's disease occurred on a farm near Sheffield, Iowa. The owner had lost seven head of cattle from an unknown cause within a week. Five weeks previously, the owner had lost several head of hogs, and three weeks later, three more pigs had died. The herd of cattle in which the deaths occurred consisted of 30 head of milk cows and heifers and one steer. These cattle were yarded in a lot (Lot 1) with the hogs. In an adjacent lot (Lot 2) there were 27 head of feeder steers but no hogs. Both groups of cattle were housed in the same cattle shed, but separated by a hayrack which divided the shed. Both groups had access to drinking water from the same watering tank. All deaths occurred in Lot 1.

On the morning of December 28, 1942, the owner noticed that one of the cows acted strangely and a veterinarian was called. The cow was treated for hypocalcemia but died during the treatment. The owner was advised that the dead cow could be safely fed to his hogs and this was done. On the morning of December 30, another cow was found dead. It had been milked the night previously and appeared then in good health. Because of the blood scattered about the place, the owner thought that the cow had cut herself in some way and bled to death. The morning of December 31, a third cow was sick. The attending veterinarian diagnosed the case as the "skin form of hemorrhagic septicemia." This animal died during the following night. On the morning of January 1, 1943, one of the cows was noticed to be off feed. In the early afternoon it became very violent and died at 7:30

p.m. There were no sick or dead animals on January 2, but on January 3, one cow was found dead and two others were off feed and had an unsteady gait. One was showing extreme irritation about the head and neck, but the other went down showing no pruritus and went into a coma at 3:30 p.m. Both cows were dead at 8:30 p.m. The heads of the latter three cows were taken to the Iowa State College Veterinary Research Institute for a laboratory diagnosis on January 4 by the veterinarian in attendance since January 1. The owner was immediately advised to remove the hogs from the cattle pen.

The length of time the animals showed symptoms before they succumbed ranged approximately from 14 to 20 hours. The temperatures of two of the animals were 101° F. and 103° F. Other animals were too violent to approach. It is worthy of note that the owner had been medicating the hogs in Lot 1, indicating an illness.

Brain Cultures Made

Cultures made from the brains of the affected cattle were found to be sterile of bacteria. Physiological salt solution suspensions of the brain were injected into rabbits by the subcutaneous and intravenous routes. The subcutaneous injections reproduced the clinical picture of "mad itch" as it is seen in cattle. After an incubation period of 48 hours, the rabbits appeared uneasy and began biting and scratching at the site of inoculation. The condition became progressively worse and the biting and scratching more persistent and savage. The skin was soon abraded and denuded of hair. As the animals became weaker, the attempts at scratching became fewer. The animals fell on their sides and were unable to rise. Their respirations became rapid and noisy, and death ensued in about 12 to 20 hours after the first evidence of pruritus.

Injected intracerebrally, the brain suspensions produced the uniformly fatal disease in rabbits. The rabbits died in 24 to 48 hours following inoculation. After an incubation period of 20 to 44 hours, the animals appeared nervous and excited. They would run about wildly in their cage, striking their heads violently against the sides of the cage. Death was preceded by coma and rapid, noisy respiration.

Diagnosis

The history of the case and the clinical symptoms of the inoculated rabbits leave but little doubt of a diagnosis of Aujeszky's disease or "mad itch." The disease has been shown to be present in Iowa, occurring sporadically in cattle and swine by Shope^{8,9,10,11} and McNutt.⁶ It is apparently contagious in rats and swine,^{9,10} but little is known about its transmission under natural conditions. The

disease apparently is not contagious in cattle. The means by which cattle become infected, and the method of spread in these animals is not clear. Patto cited by Shope⁹ noted that in all the outbreaks which came under his observation in Brazil, the infected cattle had been kept in intimate contact with swine. Burggraaf and Lourens² have stated that in an outbreak of pseudorabies in Holland in 1932, in which the disease was recognized as a relatively mild illness in swine but highly fatal in cattle, the swine became ill before the cattle on the farms. These authors further noted that, with the exception of four cows on two farms, all cattle which became infected had been housed in the same building with sick hogs. Shope^{9,10} has presented experimental evidence that swine may serve as the source of infection for cattle. He showed also that fatal infection can be induced in rabbits by bringing their abraded skin in contact with the snouts of infected pigs, and he thought it possible that cattle may become infected in a similar manner. Shope visualized a cycle of infection from rats to pigs (he showed that carcasses of infected rats were eaten voraciously by pigs which as a result became infected), to cattle, and back to rats (the rats and/or pigs feeding on carcasses of dead cattle).

If this mode of transmission is accepted, an explanation of the infection of the cattle in Lot 1 in the case reported is made possible. It is not likely, however, that the deaths of the pigs previous to the infection of the cattle were due to Aujeszky's disease, since it is rarely fatal to this species except in baby pigs, and animals affected exhibit only a transient depression and inappetence. On the other hand, the pig may have been affected with the disease and since the virus is present in the nose of a hog^{9,9,10} it is likely that the cattle lying about the barn lot may have become infected by coming in contact with the noses of the pigs. Cattle lying about a barn lot in which hogs are also kept frequently come in contact with the noses of pigs. Swine under such conditions can be observed to approach a cow and probe it in the flank or side with their snouts. In support of the supposition that the swine in Lot 1 may have been carriers of the infection and transmitted it to the cattle is the nonexistence of any fatalities occurring among the cattle in Lot 2, to which the pigs did not have access. In addition, following the removal of the pigs from the cattle pen, no more fatalities have been reported on the farm.

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