Bovine Papular Stomatitis Incidence in Veterinary Students

P.R. Schnurrenberger, L.J. Swango,
Gale M. Bowman and Patricia J. Luttgen*

ABSTRACT

Five cases of probable bovine papular stomatitis in faculty and students in a university veterinary clinic precipitated an intensive surveillance program.

A senior class of veterinary medical students was questioned at the beginning of their clinical training to determine their history of exposure to cattle and presence of lesions resembling bovine papular stomatitis. Fifty-nine of the 115 students reported having had their hands in the mouths of cattle frequently. One of the 59 had experienced a hand lesion resembling bovine papular stomatitis.

This class was maintained under close surveillance for bovine papular stomatitis-like lesions during the final 12 months of their clinical experience in veterinary school. One case developed in 8483 person days spent in the three high risk areas of beef cattle service, dairy cattle service and large animal anesthesiology.

These two bovine papular stomatitis cases compare in frequency with five class members who had been vaccinated as a result of exposure to rabid animals and two class members with brucella antibodies in their sera. The findings suggest bovine papular stomatitis infections are not unusual in veterinary students but the mild clinical manifestations make the condition relatively unimportant.

RÉSUMÉ

La découverte de cinq cas probables de stomatite papuleuse bovine, chez des étudiants et des professeurs de la clinique d'une faculté de médecine vétérinaire, hâta l'élaboration d'un programme de surveillance étroite.

On fit remplir un questionnaire par les élèves finissants, au début de leur stage d'entraînement en clinique, afin de déterminer la nature de leurs contacts antérieurs avec des bovins et le développement ultérieur possible de lésions semblables à celles de la stomatite papuleuse bovine. Cinquante-neuf de ces 115 finissants répondirent qu'ils avaient fréquemment introduit leurs mains dans la gueule de bovins; l'un d'eux déclara qu'il avait aussi noté la présence, sur une de ses mains, d'une lésion compatible avec la stomatite papuleuse bovine.

On continua à surveiller étroitement cette classe de finissants, en vue d'y déceler des lésions cutanées de stomatite papuleuse bovine, au cours des 12 mois de leur entraînement à la clinique de la faculté. Un cas fit son apparition au cours des 8 483 jours-personne passés dans les trois secteurs à risque élevé que représentaient le service des bovins de boucherie, celui des bovins laitiers et celui de l'anesthésiologie des grands animaux.

Ces deux cas de stomatite papuleuse bovine se comparent, quant à la fréquence, avec les cinq vaccinations antirabiques qu'autant d'étudiants avaient dû subir, à la suite d'un contact avec des animaux enragés, ainsi qu'avec les deux réactions sérologiques brucellaires positives, chez deux autres étudiants.

Les résultats de cette étude démontrent que les cas de stomatite papuleuse bovine ne sont pas exceptionnels, chez les étudiants en médecine vétérinaire, mais que leurs manifestations cliniques en font une condition relativement peu importante.

*Department of Microbiology (Schnurrenberger and Swango) and Small Animal Surgery and Medicine (Bowman and Luttgen), School of Veterinary Medicine, Auburn University, Auburn, Alabama 36830.

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INTRODUCTION

Bovine papular stomatitis (BPS) has been considered a zoonotic disease since at least 1942 (2) but there is little published information on frequency of the infection in man. The disease is believed to occur frequently in cattle over much of the world (4) suggesting humans in cattle related occupations should have ample opportunity for exposure.

Three students and three faculty members at Auburn University School of Veterinary Medicine had their hands in the mouth of a two year old Brahma bull in February 1978 while examining and treating it for weight loss, anorexia and intractable diarrhea. Between five and 18 days later, five of these six persons developed papules which prograssed to annular red and gray lesions on their fingers or hands. These were diagnosed as bovine papular stomatitis on the basis of the clinical appearance and isolation of agents resembling bovine papular stomatitis virus from the lesions of two cases. Three of the five remembered having wounds on their hands during exposure to the bull, at sites approximating the location of the annular lesions which appeared later. The other two denied having apparent wounds at the time of examination. One of these two had experienced typical hand lesions diagnosed as contagious ecthyma nine years earlier, followed four years later by lesions of bovine papular stomatitis. The regular assignments of the two faculty members with lesions were in other services where cattle contact was infrequent. The exposed faculty member who did not develop lesions had daily contact with cattle.

One other faculty member and an additional 11 students assigned to the same ward did not contact the bull physically and did not develop lesions.

The only oral lesions detected in the bull were bruises in the deep pharynx, attributed to earlier medication administered via an ororuminal tube.

As a result of this outbreak, a literature search was conducted to learn more of the risk BPS virus presents for veterinarians. Only eight reports describing 19 specific cases in humans were found (Table I).

There appeared to be a discrepancy between the paucity of specific reported human cases and the clustering of cases in these reports. As a result, a study was designed to explore the incidence of this infection in veterinary students.

MATERIALS AND METHODS

The 1979 graduating class of the school of Veterinary Medicine, Auburn University was maintained under surveillance during its 12 months of clinical experience.

At the beginning of the 12 month period, March 1978, the students were shown color slides of bovine papular stomatitis lesions in man and each student was asked three questions:

1. Since January 1, 1973, how frequently have you had your hand in the mouths of cattle? (never, rarely, often).
2. Compare your cattle contact before and after January 1973. (same, much more before 1973, much less before 1973).
3. Have you ever had any lesions resembling those of bovine papular stomatitis?

Special surveillance was provided in four of the 16 clinic rotations, the beef and dairy service groups which were considered at highest risk and the ophthalmology and neurology groups. The latter two were considered low risk, and therefore controls, because they were located in the Department of Small Animal Surgery and Medicine. However, they had special importance since students rotated to one or the other of these groups immediately after completing their assignment to the beef or dairy service group. Selection of these two low risk groups as controls assured close surveillance of persons who had possibly been exposed in the high risk areas throughout the probable incubation period.

As a final check, all members of the class were contacted individually during the final two days of the clinical year and asked whether they had experienced any lesions similar to BPS during the preceding year.

The routine program for preexposure immunization of veterinary students against rabies includes gathering information on their previous rabies exposures and collecting blood samples. Sera from blood samples collected during the final week of surveillance were tested for brucella antibody using the card (buffered brucella antigen) test. Sera reacting to

TA BLE I. Reported Infections of Humans with Bovine Papular Stomatitis Virus

No. Cases	Source	Comments and Confirmation	Years Reported and Reference
2	Calves experimentally infected with proliferative stomatitis virus	Repeat lesion in 1 person several months later. Lesion material produced stomatitis in calves	1953 (10)
2	Bites by cow	1 reappeared with meningitis after 5 months. No confirmation	1953 (8)
2	Wound infection, experimental cattle	No confirmation	1956 (1)
1	Wound infection, natural	Confirmed by cattle inoculation	1957 (5)
3	Naturally occurring cattle case, minor cuts on hands	10 students exposed. Microscopic examination of biopsy	1967 (3)
3	Bites by calves	Microscopic examination of biopsy	1967 (9)
1	Research project	Not stated	1967 (11)
5	Handling or bitten by cattle, natural infection	Virus isolation in tissue culture	1972 (7)

TABLE II. Frequency with which 115 Veterinary Students Had Their Hands in Cattle Mouths

Comparable Contact before and after January 1, 1973	Frequency of Hand–Mouth Contact since January 1, 1973			
	Never	Rarely	Often	Total
Same	4	29	31	64
Much more earlier	1	7	5	13
Much less earlier	0	23	15	38
Totals	5	59	51	115

this test were examined by the standard tube agglutination test.

RESULTS

There were 64 of the 115 students who reported they had rarely or never had their hands in the mouths of cattle since January 1, 1973 (Table II). Eight of the 64 reported having much more contact prior to 1973. The other 51 students stated they had their hands in cattle mouths often since January 1, 1973. These 59 (8 + 51) students could be considered at high risk of having been exposed to BPS virus prior to initiating this surveillance program but only one, a 23 year old male, reported having experienced suspicious lesions. His current contact was described as "often" and his earlier experience as "same".

These lesions occurred during the summer of 1973 after administering anthelmintic boluses to Holstein steers. No lesions were noticed in the oral cavities of the steers but no special attention had been given to this possibility.

During the worming procedure he received minor lacerations on his hands from the steers' incisors. Lesions resembling those on slides shown to the class occurred a few days later and persisted for several weeks. The veterinairian by whom he was employed diagnosed the lesions as milker's nodules.[1]

Although two students in the high risk clinic groups reported rashes of undetermined cause during the year, members of the four close surveillance groups had no lesions resembling BPS. However, on October 3, 1978, a 27 year old male in the large animal anesthesiology group scraped his left hand on the teeth of a bull while passing an endotracheal tube. Four days later a papular lesion developed at the site of the scrape, followed the next day by two pruritic lesions near the thumb. The primary lesions unbilicated, scabbed over and healed without scarring in approximately three weeks. It was considered typical of BPS. The pruritic lesions resolved uneventfully in a few days.

[1]Milker's nodules and BPS are clinically indistinguishable in man (9) and are caused by closely related viruses (6) or the same virus (12).

No BPS lesions were reported from cattle in the clinics during the study period but no special efforts were made at detection.

Five of the 115 students reported having received rabies vaccine because of exposure to rabid animals prior to entering veterinary school. No rabies exposures occurred during their veterinary education.

Two of the 109 sera collected during the final week of surveillance were reactive on the card test and had tube agglutination titers of 1:50. One of these two studients had been clinically ill the summer of 1976 when strain 19 vaccine inadvertently was sprayed into his eyes. The other student had a similar exposure the summer of 1973 but no known illness due to brucella.

DISCUSSION

This study was dependent on clinical recognition of BPS without laboratory confirmation but the lesions are sufficiently distinctive that a medically trained person should be competent to reach a presumptive diagnosis after viewing color slides of typical lesions. The 12 month duration of surveillance should have minimized problems from seasonal, but not secular, variations in occurrence.

The fact that the only case detected during the year occurred in the large animal anesthesiology group, and that the affected student volunteered the information, attested to the alertness and cooperation of the student body and the sensitivity of the surveillance program. Although the anesthesiology group had been overlooked as a probable high risk group when the project was planned, in retrospect, it should have been included in the high risk classification because of the frequency of intubation in cattle.

During the 12 month surveillance period, the students spent a total of 8483 person days in the three high risk areas (dairy, beef, large animal anesthesiology) with one case of probable BPS detected. This could have been a year of exceptional occurrence, either high or low, but there is insufficient information on this subject to permit meaningful discussion. There are apparent clusters of reports in 1953 and 1967 (Table I) and the five case outbreaks reported here. No explanation is readily apparent.

Although the extent and duration of resistance to BPS reinfection in man is unclear, two items suggest specific resistance due to earlier infection should have been minimal in this class: 1) the only suspected case in this class prior to the surveillance study had occurred five years earlier, 2) the number of students having histories of extensive cattle contact prior to entering veterinary school was small.

There is an apparent discrepancy between the paucity of reported cases in humans and the tendency of these reports to describe multiple cases. The scarcity of reports could be explained, in part, by the mild nature of the disease in both cattle and man. Although one report has suggested a meningeal form of BPS infection in man (8), it appears the major public health concern is one of differential diagnosis of the lesions from more serious conditions such as anthrax.

The current study suggests that, among Auburn veterinary students, BPS cases (2/115) occur with a frequency comparable with brucellosis infections (2/115) and rabies exposures (5/115). There is no evidence to indicate this differs from the situation among other members of the profession in the U.S. The prevalence found in the study reported here plus the innocuous nature of the uncomplicated localized lesions place BPS low on the list of zoonoses in terms of public health importance.

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