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Report of a Case

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SINCE the review article by Controni in 1967[1], only one other case[2] of meningitis due to Pasteurella multocida has been added to the reported 14 cases. The relative rarity of this problem makes the following case of interest.

Case Report

A 44-year-old white male farmer suffered fractures of the clavicle, zygoma and skull on February 7, 1971. While in the hospital, he developed a fever of unknown origin and was given a course of ampicillin for one week. Following discharge home he did well, was oriented and active until March 2 when he developed severe headache, confusion, and became uncontrollable, grabbing his head and responding poorly. When brought to the Emergency Room, his blood pressure was found to be 120/70, temperature 39.6°C. (103.4°F.) pulse 104, and respiration 22 per minute. General examination showed teeth in very poor repair. The patient was confused and responded only to pain. Nuchal rigidity was present but there were no localizing signs. Laboratory studies were hemoglobin, 16.4 gm%; white blood count, 26,200 cu/mm with 10 bands and 76 segmented neutrophils. Urinalysis, VDRL and SMA-12 studies were normal. Initial spinal fluid was cloudy. There were 20,680 white cells, 98% polychromic normoblasts (polys). Spinal fluid glucose was 11 mg %, protein 560 mg %, chloride 102 m Eq/l. An India ink examination was negative. Direct smear showed many polys, but no bacteria. However, the culture revealed a light growth of gram-negative rods, consistent with Pasteurella multocida and confirmed by the Michigan Department of Health. Sensitivity studies showed the organism to be sensitive to penicillin, ampicillin, tetracycline and the cephalosporins with resistance to kanamycin, neomycin and streptomycin. Urine and blood cultures were negative. A repeat spinal tap on March 3 revealed 1,143 white cells cu/mm with 60% polys; protein, 315 mg%. Progress spinal tap on March 9 demonstrated 80 white cells cu/mm; 98% lymphocytes. Protein was 108 mg %. Spinal fluid cultures taken March 3 and March 9 were negative. Progress white bloodcell count on March 9, was 6,700 with a normal differential count. Chest x-ray was normal. Skull x-rays showed a linear fracture of the left temporal bone. Brain scan showed no abnormality other than that attributed to the skull fracture. During the hospital course, the patient was initially treated with intravenous ampicillin, 8 gms daily, and kanamycin. The initial fever response was satisfactory, but after 36 hours the temperature rose to 38.8°C (102° F.) Because the febrile relapse was believed to be a drug fever, ampicillin was discontinued after four days in the hospital. The patient was then given a one-week course of parenteral cephalin sodium, 12 gms daily. He remained afebrile throughout the last week in the hospital with much clearing in his mentation. The patient was discharged March 17 to take tetracycline, 250 mgs four times a day. When seen as an outpatient about two weeks later, he had maintained satisfactory improvement.

Discussion

Infection due to Pasteurella multocida can be divided into three types: (1) Associated with local infection, most commonly secondary to cat bites; (2) Associated with chronic respiratory disease, and (3) Systemic infection with sepsis and/or meningitis.

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When Controni reviewed the literature regarding Pasteurella meningitis[1] he cited 14 cases of meningitis due to this organism. Overall mortality was 50%. Twelve were males, one infant and two females with age range from 88 hours to 83 years. As in our case, four patients had previous skull fracture and two had a history of previous brain surgery. Often there is a gap of several weeks from the time of injury until the onset of meningitis.

The organisms involved are gram-negative coccobacillary bacteria and can often be confused with Hemophilus influenzae. On sheep blood agar they appear as shining, rounded, convex, gray-white colonies, 1-2 mm in diameter. There is no growth on MacConkey's, desoxycholate citrate or EMB media. The organism ferments xylose, sucrose, mannitol and dextrose with production of indole and reduction of nitrates, but there is no gas production.

Pasteurella multocida is present in the environment and a recent brief survey[3] showed it was recovered from the teeth and gums in four cats and four dogs, without overt mouth disease. The survey included ten dogs and four cats.

In cases of meningitis, there is usually no history of preceding animal exposure, but the relationship to brain surgery or head injury is common.[1]

Recent reviews by Tindall and Harrison[4] and by DeBoer[5] point out that the incidence and recognition ot the organism seem to be increasing.

Pasteurella multocida is usually sensitive to tetracycline and chloromycetin, but unlike other gram-negative organisms, it is usually sensitive to penicillin as well.[1,2,5] According to Swartz,[6] there is enough variability in the antibiotic sensitivity to warrant in vitro testing in each case. The question of penetration of the cephalothins into the spinal fluid remains unanswered. Vianna[7] pointed out that because of its relatively poor entrance into the spinal fluid, cephalothin probably should not be the only antibiotic used. There are other reports[8] of sub-optimal response to cephalothin therapy in meningococcal meningitis.

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