

Pasteurella pneumotropica: meningitis following a dog bite

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Summary: A 38 year old man developed meningitis following a dog bite. *Pasteurella pneumotropica*, usually an animal pathogen, was isolated from the cerebrospinal fluid. The patient made a complete recovery after antibiotic therapy. The relevant literature is reviewed.

Introduction

Pasteurella pneumotropica is usually an animal pathogen, which rarely causes infection in humans. I report a case of *P. pneumotropica* meningitis following a dog bite.

Case report

A 38 year old unemployed labourer was admitted with a 5 day history of severe frontal headache, nausea, vomiting, malaise and back pain, after a head injury sustained in a fight. He had been bitten by a dog a few days before admission. His past medical history consisted of a blackout a few months previously which was thought to be alcohol related. He had a 15 year history of alcohol abuse, drinking on average 15 pints per night. On examination he was pyrexial at 39.2°C. He had marked neck stiffness, but was alert and orientated with no photophobia. He had superficial lacerations over his nose, right ear and cheek and there was a recent dog bite on the right thumb. The pulse rate was 130 beats/minute and the blood pressure 130/80 mmHg. Lumbar puncture revealed cloudy cerebrospinal fluid (CSF) with 1900 neutrophils per cubic mm, glucose <1 mmol/l and protein 4008 mg/l. No organisms were seen on Gram staining. Routine blood tests showed white cell count $6.8 \times 10^9/l$, haemoglobin 11.4 g/l, MCV 91.4 fl, platelets $495 \times 10^9/l$, urea 2.1 mmol/l, gamma glutamyl transferase 236 U/l, with other liver function tests normal. Blood glucose on admission was 6.2 mmol/l.

A diagnosis of bacterial meningitis was made. As light microscopy of the cerebrospinal fluid had not

shown any organisms, the patient was empirically started on intravenous benzyl penicillin and chloramphenicol. Flucloxacillin was added in case of staphylococcal infection of the facial lacerations. Within 24 hours the pyrexia had settled and the patient was clinically much improved. Culture of the CSF yielded a growth of a pleomorphic Gram-negative bacillus, identified as *Pasteurella pneumotropica* using the API 20 NE System kit. The organism was not recovered from blood cultures. The organism was sensitive to chloramphenicol, ampicillin, erythromycin, cotrimoxazole and Augmentin (amoxycillin and clavulanic acid). Once the sensitivity results were available, the patient was treated with Augmentin alone rather than chloramphenicol, because of the known risks of hepatic and bone marrow toxicity. The patient made an uneventful recovery and remained well when reviewed in the outpatient clinic 6 weeks later.

Discussion

The genus *Pasteurella* comprises a group of Gram-negative pleomorphic bacteria which are primarily animal pathogens. *Pasteurella multocida* is the organism most commonly associated with human infections, usually isolated from infected dog bites. It can also cause septicaemia in patients with hepatic dysfunction, sometimes with metastatic seeding including meningitis.¹ *Pasteurella pneumotropica* was first isolated from laboratory mice in 1950 by Jawetz,² and was so named because of characteristic lung lesions. It has since been isolated from rats, cats and dogs. Eleven cases of human infection with *P. pneumotropica* have been reported to date, of which 7 had direct contact with animals. Of these, 2 patients had *P. pneumotropica* meningitis,³ the other cases being infected dog bites,^{4,5} septicaemic shock,⁶ upper respiratory tract

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infection,⁷ and osteomyelitis with arthritis.⁸

Meningitis very rarely occurs as a complication of a dog bite. One other organism has been implicated in addition to *P. pneumotropica* and *P. multocida*. A Gram-negative rod known as DF-2 (dysgonic fermenter) present in the oropharynx of dogs, has been isolated in 4 cases of meningitis⁹ in dog handlers. Whether or not these patients were bitten is not documented.

This patient presumably became infected with *P.*

pneumotropica following the dog bite. It is possible that his high alcohol consumption caused some degree of hepatic dysfunction and immunosuppression¹⁰ predisposing him to this unusual infection.

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