

Please read this bit first

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

Cycle 20 Organism 9:

Pasteurella multocida

Description of the pathogen

Pasteurella are Gram-negative coccobacilli that inhabit the oral cavity and the gastrointestinal tract of many animals. Species of the genus *Pasteurella* are non-motile, facultatively anaerobic measuring 1 to 2 µm in length. DNA hybridization studies have determined that they are closely related to *Actinobacillus* species¹. The majority of the strains are fermentative and indole, catalase, oxidase, and sucrose positive². They grow on a variety of commercial culture media including blood and chocolate agar.

Holst *et al.* characterized and speciated 159 strains of *Pasteurellai* recovered from 146 patients over 3 years. The majority of infections were caused by 5 different species or subspecies: *P. multocida* ssp. *multocida*, *P. multocida* ssp. *septica*, *P. canis*, *P. stomatis*, and *P. dagmatis*³.

Epidemiology

Pasteurella spp., particularly *P. multocida*, appear to have a worldwide distribution⁴. For the majority of *Pasteurella* spp. the principal reservoir is in animals. *P. multocida* has been isolated from the upper respiratory tracts of a variety of animals including dogs, cats, pigs, rats and buffalos. Dogs and cats have particularly high colonization rates. In most cases the carriage is asymptomatic⁵. Respiratory tract colonization by *P. multocida* in humans is known to occur. In most cases colonized patients have underlying upper or lower respiratory tract diseases



including chronic sinusitis and bronchiectasis⁴. Most colonized patients have a history of household or domestic animal contacts⁴.

Clinical manifestations

Human infections with *Pasteurella* can be divided into three types: infection occurring after animal bites, usually from dogs or cats; infection occurring after animal exposure; and infection with no known animal contact⁴.

Most reported cases of *Pasteurella* infections in humans are caused *P. multocida* and involve skin and soft tissues⁶.

Respiratory tract infections with *Pasteurella* spp. involve the upper respiratory tract , causing sinusitis, and bronchitis, and the lower respiratory tract causing both pneumonia and empyema⁶.

Other sites of infection are uncommon. Bone and joint infections with *Pasteurella* spp. have been reported on rare occasions⁷. Central nervous system infections with *P. multocida* have also been reported infrequently⁸. Septicaemia is another uncommon complication of *P. multocida*⁹.

Treatment

In vitro studies indicate that penicillin is the best antimicrobial agent for the treatment of virtually all forms of infection^{4, 6}. Minimum inhibitory concentrations (MICs) of various strains of *P. multocida* to penicillin have ranged from 0.049 – 0.39µg/ml and from 0.19 – 0.78µg/ml¹⁰. Antistaphylococcal penicillins such as cloxacillin are not as active and are not recommended for treatment of *P. multocida* infections¹⁰. Amoxicillin-clavulanic acid has excellent in vitro activity. Among the non-beta-lactam antibiotics, agents with good in vitro activity include tetracyclines, fluoroquinolones, chloramphenicol, and trimethoprim-sulfamethoxazole¹⁰.

References

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4. Jones FL, Smull CE. Infections in man due to *Pasteurella multocida*. Penn Mad J. 1973;**76**:41-44.
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9. Raffi F, *et al.* *Pasteurella multocida* bacteremia: Report of thirteen cases over twelve years and review of the literature. Scand J Infect Dis. 1987;**19**:385-393.
10. Stevens DL, *et al.* Antibiotic susceptibilities of human isolates of *Pasteurella multocida*. Antimicrob Agents Chemother. 1979; **16**:322-324.

Questions

1. How would you differentiate between the genera *Pasteurella multocida* and *Moraxella catarrhalis*?
2. How would you isolate *Pasteurella multocida*?
3. What characteristics are used to identify *Pasteurella multocida*?
4. What infections are caused by *Pasteurella multocida*?