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Brucella at the Clinic: A Case of High-Risk Occupational Exposure in an Urban Veterinarian

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Introduction

- Brucellosis is a globally significant zoonosis, causing multisystemic disease in humans.
- Among the four *Brucella* species pathogenic to humans, *Brucella canis (B. canis)* is less commonly reported but poses occupational risks to veterinarians[1,2].
- Though prevalent in rural, livestock-heavy areas, it's rare in urbanized, developed regions like Singapore, where the last human case was reported in 2009[3].
- Diagnosis is challenging due to serological limitations, and the use of post-exposure prophylaxis (PEP) remains controversial.
- We present a rare case of high-risk *B. canis* exposure in a veterinarian, highlighting crucial considerations for occupational brucellosis exposure in veterinarians.

Case Vignette

- A 33-year-old Chinese male veterinary surgeon presented to our infectious diseases' clinic following a high-risk occupational exposure. During an orchiectomy on a local dog with orchitis, canine scrotal fluid, later confirmed via PCR to contain *B. canis*, splashed onto his scrubs and an open chest wound.
- Despite being asymptomatic with a normal physical examination, the high-risk exposure and limitations of local diagnostic tests prompted a joint decision with the patient to initiate a three-week course of doxycycline and rifampicin as PEP for brucellosis.
- Initial Brucella serology, processed by Mayo Clinic (the only local diagnostic option), was negative. At a three-month follow-up, the patient remained clinically well and asymptomatic, experiencing no adverse effects from the PEP.

Discussion / Learning Points

- **Rising Risk:** With pet ownership on the rise in Singapore (114,000 in 2023[4]), veterinarians face increasing occupational exposure to *B. canis*, particularly during close animal care and surgical procedures.
- **Hidden Threat:** Human brucellosis is not a notifiable disease locally, and *B. canis* infections in dogs are not always reported. This likely means the true prevalence is underestimated, underscoring the need for enhanced surveillance, systematic reporting, and even eradication programs in high-density urban settings.
- **Diagnostic Blind Spot:** Routine serology used in Singapore (sent out test to Mayo Clinic) is ineffective for *B. canis*, as it lacks the smooth LPS O-chain detected by standard assays[5]. Diagnosis instead requires specialized rough LPS tests, cultures that are slow and variably sensitive, or molecular methods such as PCR. More advanced diagnostic platforms (e.g., Karius) exist but remain costly and inaccessible.
- **Clinical Challenge:** Human infection often presents with vague, flu-like symptoms such as fever, malaise, and arthralgia. These non-specific features mimic many common illnesses, contributing to frequent underdiagnosis, delayed treatment, and inappropriate use of post-exposure prophylaxis.
- **Prevention First:** Consistent use of personal protective equipment (PPE) and strict laboratory biosafety practices are the first line of defense. Equally critical is heightened awareness of *B. canis* as an emerging zoonotic risk in veterinary practice.
- **PEP matters:** Post-exposure prophylaxis can be lifesaving if initiated promptly after high-risk exposure, particularly for immunocompromised or pregnant individuals. Standard regimens typically involve doxycycline with rifampicin for three weeks, though prophylaxis may be extended up to six months depending on risk. Strain-specific resistance, such as with *B. abortus* RB51, requires alternative regimens[6].
- *Brucella canis* is present in Singapore's domestic canine population and poses an occupational hazard to veterinarians, particularly with rising pet ownership. Heightened clinical awareness is essential for timely diagnosis, appropriate management, and stronger public health surveillance.

References

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