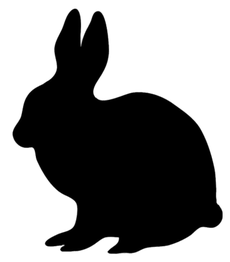
"Nobunny wood" have guessed it, a rare case of pneumonic tularemia



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INTRODUCTION

Tularemia - also called rabbit fever or deer fly fever - is a very rare infectious disease that is caused by the bacterium, *Francisella tularensis*. The incidence of tularemia has been fewer than 0.15 per 100,000 cases or less since 1965 [1]. Despite one etiology, the disease has multiple forms of symptomology and progression, all of which include fever. Variations include ulceroglandular, oculoglandular, oropharyngeal, pneumonic, and typhoidal tularemia. Tick bites, deer flies, infected rabbits, and airborne bacteria are some modes of transmission from which the disease can spread [2]. If left untreated, this rare disease can have fatal consequences, making its accurate diagnosis particularly important.

CASE REPORT

Patient was a 22 year-old male with no known PMHx who presented with persistent nightly cyclic fevers up to 104F, drenching night sweats, and pleuritic chest pain for 2-3 weeks. He had associated anorexia, unintentional weight loss of twenty pounds over three weeks duration, and two episodes of urinary incontinence. He reported recent travel to Michigan (spending two days in a forest), Arizona, Tennessee, and Kansas City (spending two days camping) but denied any exposure to ticks. He worked as a landscaper. He does report mowing over numerous rabbit burrows over the past year. Despite owning three cats he did not experience cat bites or scratches. He reports being sexually active without barrier protection and vaping nicotine and marijuana. On exam, he was febrile, had no mouth ulcers, lymphadenopathy, or skin rashes. Labs were significant for elevated inflammatory markers (see Table 1). A CT chest and abdomen from an outside hospital previously demonstrated two small left-sided nodules and a mildly enlarged left hilar lymph node. The radiographic findings of the pulmonary nodules were more consistent with an infectious etiology than a neoplastic etiology. Given his travel history, extensive infectious disease tests were ordered, most of which resulted negative; his sexual history prompted testing for HIV, herpes, and syphilis which were also negative. Ultimately, the patient tested positive for Tularensis IgM, IgG and Epstein Barr Virus IgG antibodies (see Table 2). Blood cultures resulted in no growth of organisms. He was started on a two week course of ciprofloxacin and recommended to follow up with infectious disease. The patient reported improvement in his symptoms after treatment.

LABORATORY

PERTINENT LABORATORY TESTING	
PROCALCITONIN	Negative (<0.05 ng/mL)
ALT	57 (H)
AST	25
WBC	8.8 x 10^3/microliter
CRP	9.2 mg/dL (H)
ESR	98 mm/h (H)
TSH	1.614 micu/mL

Table 1: Pertinent laboratory test results of patient, notable for elevated inflammatory markers

INFECTIOUS DISEASE TESTS	
RESPIRATORY PATHOGEN PANEL	Negative
BLOOD CULTURES	Negative
HIV RNA ULTRA TEST	Negative
CMV DNA TEST	Negative
HSV DNA TEST	Negative
VSV DNA TEST	Negative
HHV-6 DNA TEST	Negative
EBV DNA TEST	Positive
HISTOPLASMA ANTIGEN/ANTIBODIES	Negative
MONOSPOT TEST	Negative
TULARENSIS IgG	Positive (>100 units/mL)
TULARENSIS IgM	Positive (>100 units/mL)
BLASTOMYCES ANTIBODY	Negative
WEST NILE IGG	Negative
WEST NILE IGM	Negative
TREPONEMA PALLIDUM ANTIBODY	Negative
COCCIDIOIDES ANTIBODY	Negative
CRYPTOCOCCAL ANTIGEN	Negative

Table 2: Various Infectious Disease Tests results of patient, with notable positives including EBV DNA Test, Tularensis IgG,and Tularensis IgM

DISCUSSION

While tularemia is a rare clinical occurrence, the initial signs and symptoms of the disease are often nonspecific and overlap with fungal and bacterial pneumonias, tuberculosis, or malignancy [3]. As noted in our patient, who also tested positive for Ebstein-Barr Virus, which may have confounded his lymphadenopathy and recurrent fevers. In addition, in setting of high grade fevers, lymphadenopathy, and unintentional weight loss, malignancy was also considered as part of the differential, especially in a young, otherwise healthy male. Therefore, it becomes highly important to recognize the highly associated risk factors such as geographical distribution, occupations in gardening and landscaping, and work with wildlife.

Although widely distributed, tularemia is mainly a Northern Hemisphere disease [1]. The diagnosis of tularemic pneumonia should be considered in any patient presenting with atypical pneumonia, and ulcer and/or lymphadenopathy, and a history of travel/outdoor activity. Serological diagnosis is key, and although *F. tularensis* can be cultured from the sputum, skin culture, pleural fluid, and lymph nodes, they should not be obtained because of the hazard it poses to laboratory personnel [3].

Regardless of the variance of tularemia that develops, active disease demonstrate a paradoxical effect and blood cultures are often negative for growth. Antibiotic regimens are dependent on the stage of illness and can include aminoglycosides, tetracyclines, and fluoroquinolones [2]. Although the annual incidence of tularemia is quite low, it is important for clinicians to consider it as a differential diagnosis in those suspicious for infectious fevers of unknown origin.

CONCLUSION

- The differential diagnosis of fever of unknown origin includes various fungal and bacterial infections, tuberculosis and malignancy. Although tularemia is fairly uncommon, recognition of certain risk factors can help identify the diagnosis.
- Typical treatment options of tularemia include aminoglycosides, tetracyclines, and fluoroquinolones, depending on severity of disease.

REFERENCES

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