

# An Unexpected Case of Ulceroglandular Tularemia in a Pediatric Patient on Long Island

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## Introduction

Tularemia is a zoonotic infection caused by the bacteria *Francisella Tularensis*. It is a small, fastidious, non-spore-forming aerobic gram negative coccobacillus which in addition to humans affects more than a 100 animal species particularly ground squirrels, rabbits, hares, voles and muskrat [1]. The organism is most frequently transmitted by ticks & biting flies [1] but can also be transmitted by direct contact with rabbits or other infected animals or their aerosols, other biting insects and contaminated food & water. There are 6 major clinical forms of tularemia including, (ulcero) glandular, oculoglandular, oropharyngeal, typhoidal gastrointestinal and the most severe form which is pneumonic. Tularemia is not a common entity, according to the CDC table of reported cases, 0 (zero) cases of Tularemia were reported in NYS in 2015 [2] with 0 cases reported in New York State cases reported in New York State in 2015. We report a case of ulceroglandular Tularemia in a 6 y/o previously healthy female who presented with persistent fevers x 2 weeks.

## Case Description

A six year old previously healthy girl presented to her pediatrician with a few days of scalp pain following a tick bite, the tick was removed and she was started on amoxicillin/clavulanic acid by her pediatrician for prophylaxis against possible Lyme disease. She did not tolerate this and subsequently developed fever, sore throat, nausea, emesis, diarrhea and headaches. She was seen multiple times in the ED and her doctor's office with limited evaluations including CBC, Rapid Strep, Urinalysis and respiratory viral panel done, only positive finding was rhino/enterovirus positive by PCR on respiratory viral panel. Supportive care recommended each time and she was discharged home. On Day 11 of illness, she presented to the ED again with persistent fevers, diarrhea, and fatigue and decreased oral intake, activity and now muscle pain limiting her mobility. In the ED, ROS was positive for fever, abdominal pain, headache, neck stiffness and decreased activity. Physical exam was significant for Vitals: Temp: 38.3, HR: 137bpm, RR: 24br/min, BP: 100/62, Oximetry 96% on room air. Positive findings on exam included an intermittently irritable child with a 2x3cm scabbed circular lesion, boggy and very tender to palpation on her right occiput, she also had small occipital lymph nodes. The rest of her exam was within unremarkable, although she refused to ambulate; she had normal musculoskeletal exam and normal strength to active and passive motion while lying in bed. Laboratory studies were significant for an initial WBC of 9.7K/uL that then trended up to 13.82 with a differential of 66.4% neutrophils, 25.3% lymphocytes, 7% monocytes, hemoglobin 10.6g/dL and hematocrit 33.6% and platelets 435K/uL, ESR was elevated at 30mm/hr and CRP as well at 10.1mg/dL her Lyme ELISA was negative. Nasopharyngeal swab for a respiratory viral Panel was positive for Rhinovirus/Enterovirus; EBV Panel was negative. Due to history of tick bite, more history was obtained from her doctor and they report the tick may have been a dog tick and in light of her ulcerative lesion with associated lymphadenopathy tularemia serology was sent and patient started on ciprofloxacin. *F. tularensis* antibody IgM 28 16U/ml considered positive, IgG 19U, tentative diagnosis of ulceroglandular tularemia was given and she was discharged home on oral Ciprofloxacin which she was not able to tolerate and then switched to doxycycline with improvement in symptoms. Repeat serology done >2 months later showed a significant increase in her IgG now 25 and IgM of 38 confirming the diagnosis.

## Discussion

*F. tularensis* which causes the clinical disease tularemia is an aerobic fastidious gram negative organism that can be classified in many subspecies, the subspecies *F.t. tularensis* and *F.t. holarctica* cause majority of human infections. *F. tularensis* infects more than a 100 species of wild and domestic vertebrates and over a 100 species of invertebrates. Animals vary in their susceptibility and response to infection but many such as rabbits tend to develop a fatal illness. There are various modes of transmission, tick bites, insect bites, ingesting contaminated meat & water and aerosolized spread

[1]. Tick exposure is the most common in children, the American dog tick (*Dermacentor variabilis*), the wood tick (*Dermacentor andersoni*) and the lone star tick (*Amblyomma americanum*) are the ticks in the US that have been shown to transmit Tularemia [3].

It is highly virulent and only needs a small inoculum, there are 6 major manifestations, the ulceroglandular form is the most common form and the clinical form most easily recognized as tularemia as was seen in our patient. These patients usually report recent animal contact or exposure to potential insect vectors or ticks. Affected patients typically present with fever and a single erythematous papulo-ulcerative lesion with a central eschar at the site of a tick bite. Tender regional lymphadenopathy may begin before, at the same time, or shortly after the appearance of the skin lesion. Adenopathy involving cervical or occipital nodes is more common in children than adults, and the associated ulcers may be hidden in the scalp again as seen with our patient. Diagnosis is usually confirmed serologically by

detecting antibodies to *F. tularensis*. Gram-stained smears and tissue biopsies rarely demonstrate the organism. Aminoglycosides are drug of choice. This case highlights the importance of a thorough history especially in the light of a clinical picture that is not progressing as expected. In our case we would have expected an otherwise routine viral illness to start to resolve and not persist unabated as in her case. It also highlights the importance of a very thorough physical as the lesion on her scalp could easily have been missed.

## References

1. Lorry G. Rubin, Sarah S Long. *Francisella Tularensis (Tularemia) Principles and Practice of Infectious Diseases*. 3: 1171.
2. CDC Table of Reported Cases 2005-2015, Tularemia section.
3. Tularemia: Transmission.