

Brucella Induced Thyroiditis: Case Report and Literature Review

Abrar N. Fatani¹, Abdullah A. Alesa^{2*}, Ahmed M. Alfaidi², Rawia F. Albar³

¹ King Abdulaziz University – Jeddah, ² King Saud bin Abdulaziz University for Health Science (KSAU-HS) – Jeddah, ³ Assistant consultant KSAU-HS, Consultant General Pediatrics and Pediatric Pulmonology

*Corresponding author: Abdullah A. Alesa, email:Alesa.m.d@gmail.com

ABSTRACT

Brucellosis is a zoonotic disease that can affect multiple organs and tissues in the human body with various clinical presentations; however the thyroid gland is rarely involved. There are many species of Brucella, but only a few can cause symptomatic infections to humans, with Brucella melitenses being the most common. Here we report a case of Brucella induced thyroiditis which presented with pyrexia of unknown origin (PUO) and a neck swelling. The patient had abnormal thyroid function test and a positive Brucella serum agglutination. Early diagnosis and appropriate anti Brucella management showed great response and the patient fully recovered. We hope to shed some light on this rare complication of Brucella infection through our study. We have conducted a literature review of six cases that reported the same condition with some notable differences. We believe that it is crucial to include brucellosis in the differential diagnosis of any patient presenting PUO especially when there is a positive history of unpasteurized dairy product consumption.

Keywords: Brucellosis, Thyroiditis, thyroid diseases.

INTRODUCTION

Brucellosis is a zoonotic disease that can affect multiple organs and tissues in the human body with various clinical presentations; however, the thyroid gland is rarely involved. The gram negative bacteria are transmitted to humans by contaminated animals through digestion, direct contact or inhalation. There are many species of Brucella, but only a few can cause symptomatic infections to humans. Brucella abortus, Brucella melitenses, are the most common, while Brucella canis, and Brucella suis, are less frequently reported to cause the disease in humans ⁽¹⁾. However, knowing the exact species will not affect the choice of therapy. Patients might present with nonspecific symptoms, such as headache, fever, weight loss, and they might have lymphadenopathy or hepatosplenomegaly as physical signs. They also might develop some serious complications such as meningitis and osteomyelitis ⁽²⁾. The definitive diagnosis of brucellosis is based on serology and culture or both. Here we report a case of Brucella induced thyroiditis and a literature review of six cases that reported the same condition.

CASE REPORT

Fifty three years old female patient known case of diabetes mellitus and gastroesophageal reflux disease, on medications, presented with fever and sore throat for the last two weeks. She was admitted as a case of pyrexia of unknown origin for investigation. Documented fever at first day was 38.8°C and spiking up to 39.5°C in her first three days of admission. The patient complained of frontal headache, left neck pain and swelling, associated with fatigue, palpitations and decreased oral intake. She also gave a positive history of

cheese ingestion that was taken from a rural area almost one month prior to her presentation. These symptoms were preceded by upper respiratory tract infection (URTI) that was treated with Augmentin for 10 days. The fever was relieved by acetaminophen for one hour and then spike up again. There was no dyspnea, cough, no lymph node enlargement, rash, arthralgia or diarrhea. Review of systems was unremarkable. Laboratory investigations showed a hemoglobin of 10.4gm/dL, normal WBC and platelets. She had elevated ESR and CRP, with a value of 120mm/hr and 77.6mg/L, respectively. Her thyroid function test revealed a low TSH of 0.03 mIU/L and a high T4 level of 21.2pmol/L, and was even higher when repeated two days later, reaching to 27.6 pmol/L.

Her Brucella serology by enzyme linked immunosorbent assay(ELISA) was negative, even when repeated three weeks later. Chest X-ray and CT were normal, but thyroid uptake scan showed moderate reduced blood flow and significant diffuse suppressed thyroid function, giving the impression of subacute thyroiditis. Blood and urine culture were all negative. Brucella serum agglutination titer was done and showed a positive result of 1:160, and accordingly the patient was started on Rifampicin and Doxycycline. Doxycycline was stopped after two days as the patient developed severe esophageal pain and changed to Ciprofloxacin plus Rifampicin. The patient was discharged after two weeks from the time of admission. She was afebrile for the last two days and planned for six weeks of Ciprofloxacin and Rifampicin. Two months after discharge, the patient recovered completely and all her laboratory workup including the thyroid function returned to normal.

Table (1): literature review of six cases with Brucella induced thyroiditis

Reference	Age	Gender	Signs and symptoms	Labs	Species	Medication
<i>Vermiglio et al.</i> ⁽³⁾	42	Female	Anterior neck swelling, sore throat, dysphagia, dysphonia, neck discomfort, fever, anorexia, weight loss, headache and night sweats	Serum anti-brucella agglutinin titer of 1:800, WBC 4.400/mm ³ increase 40% lymphocytes, ESR 52, TFT was normal	Brucella Melitensis	Tetracyclin 500 mg + streptomycin 500 mg for 30 days
<i>Von Graevenitz and Colla</i> ⁽⁴⁾	53	Female	Painful swelling of the anterior neck, irritability, weight loss, hard tender mass in the right lobe moves with swallowing.	ESR: 60 mm/h. TFT normal. Anti-Brucella agglutinins, were 1:160, and 1:320 following 2-mercaptoethanol treatment. (after second surgery)	Brucella Melitensis	Tetracycline 500 mg was given for three weeks then underwent surgery and resumed Tetracyclin for 6 weeks + Streptomycin 500 mg
<i>Von Graevenitz and Colla</i> ⁽⁴⁾	25	Male	Fatigue, fever, tender neck mass right lobe move with swallowing skin was red and warm.	ESR: 70 mm/h TFT normal, Serum anti-Brucella agglutinins were 1:320	Brucella Melitensis	Doxycycline 100 mg + Rifampicin 450 mg
<i>Azizi and Katchoui</i> ⁽⁵⁾	22	Female	Fever and a painful swelling of the anterior neck. Mass in the lower pole of the right lobe	ESR: 60 mm/h. TFT normal. Anti-Brucella agglutinins, were 1:280, and 1:320 following 2-mercaptoethanol	Brucella Melitensis	Tetracycline 30 mg/kg + streptomycin 1 g IM taken for 6 weeks
<i>Azizi and Katchoui</i> ⁽⁵⁾	60	Female	Painful anterior neck swelling, dyspnea, and fever. lymphadenopathy in both axilla. Maculopapular lesions in both femoral regions.	ESR:19 TFT:normal. Serum anti-Brucella agglutinins were 1:320 and 1:640 in two successive samples, and 1:320 following 2-mercaptoethanol treatment.	Brucella Melitensis	Rifampin + cotrimoxazole
<i>Azizi and Katchoui</i> ⁽⁵⁾	52	Female	Tender mass in the thyroid region, fever, chills and nodule in left lobe	Serum anti-Brucella agglutinins were positive TFT normal	Brucella Melitensis	Treated with streptomycin and tetracycline without improvement. Fever continued, and she developed pain and tenderness in the thyroid area. After FNA diagnosis treated with rifampin and doxycyclin

DISCUSSION

Our review consisted of six cases of Brucella infection of the thyroid gland. They were gathered using the PubMed search with the key words “Brucellosis” and “Thyroiditis”. Mesh terms used were “Brucella” and “Hyperthyroidism”. The average age was 42 and all the patients were female except for one case, with their age ranging 22-60. The most common presenting complaints were neck mass and fever, unlike our case which presented for the fever mainly. Five cases had increased ESR, but thyroid function test was normal in all six cases. However our patient had elevated TFT and ESR.

All six cases underwent fine needle aspiration (FNA) and had positive cultures from thyroid material or sinuses, all of them grew *Brucella melitensis*. The most common finding in scintigraphy was cold nodule in four out of six patients, such as in our patient, the remaining two cases did not do the scintigraphy test. Our case had normal X-ray and CT scan, but in two of the reviewed cases there was tracheal displacement. one case required surgical removal of the neck mass, which was histologically diagnosed with large medullary carcinoma. All patients showed great response to anti Brucella medication except one case in which the outcome was not mentioned. All patients had positive anti Brucella agglutinin test like our case. Acute suppurative thyroiditis is an inflammatory disease of the thyroid gland caused by bacteria. Most commonly staphylococcus and streptococcus bacteria, usually spreading hematogenously. Normally, the thyroid gland can resist infections due to high blood supply, lymphatic drainage and the presence of iodine⁽¹⁾.

Patients with acute thyroiditis commonly presents with fever and painful mass over the thyroid. However, they usually have a normal thyroid function test and negative thyroid autoantibodies. *Brucella melitensis* can infect any organ as it is a facultative bacterium. We can diagnose Brucella thyroiditis by having a positive

Brucella antibody titer, a positive FNA cytology, patient responding to anti Brucella antibiotics or through blood cultures. It can be treated with Tetracycline, Doxycycline, Cotrimoxazole, Rifampin and Streptomycin, most of them ending with a good clinical outcome⁽⁶⁾.

CONCLUSION

In conclusion, thyroiditis can be a rare complication of Brucella infection mainly due to the high vascularity of the thyroid gland. However, it is very important to consider brucellosis when dealing with patients presenting with pyrexia of unknown origin or a neck swelling with a positive history of unpasteurized dairy product consumption. Early diagnosis and appropriate management with anti Brucella antibiotics is crucial to ensure good clinical outcome.

The study was done after approval of ethical board of King Saud bin Abdulaziz university.

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