



Non-Tuberculous Mycobacteria Infection in a Nigerian Teenager in Uyo; A Case Report

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Abstract

Non-Tuberculous Mycobacteria are species other than the Mycobacterium tuberculosis complex which cause a wide range of diseases (excluding leprosy) in children and adults especially those with interruptions to their cell mediated immunity as seen in patients with the Human Immunodeficiency Virus (HIV). The most common manifestation of this infection is cervical lymphadenitis which may rupture to form ulcers. Our patient is a 17-year-old teenager who presented initially to a primary health care centre (PHC) with complaints of neck swellings/ulcers, weight loss, and recurrent fever of 18 months duration. She tested positive for HIV and TB (gene expert) at the PHC and was commenced on standard HIV and TB medications at the PHC. Due to persistence of symptoms, she was referred to our facility, where repeat TB medications and antibiotics were administered with non-resolution of neck swellings/ulcers. Line probe assay done was suggestive of non-Tuberculous Mycobacterium. Culture was not done as sample was lost in transit to the reference lab. Patient received a six-month course of Oral Azithromycin and TB medication with surgical excision of affected lymph nodes and showed marked resolution of symptoms. High Index of suspicion is needed when evaluating patients for TB, especially when they have significant cervical lymphadenopathy/ulcers and do not respond adequately to standard therapy. There is also a need for increased availability of culture facilities in resource-challenged countries like ours.

Keywords: Adenitis, Non-Tuberculous Mycobacterium, Human Immunodeficiency Virus

Introduction

Non *Tuberculous Mycobacteria* (NTM) are ever-present bacterial organisms found in our environment, including soil, drinking water, and sometimes pets.¹ They are species other than the Mycobacterium tuberculosis complex; over 140 species exist, and they cause a wide range of diseases (excluding leprosy) in both children and adults.²

Interruptions to cell-mediated immunity in children from diseases like HIV make one more susceptible to infections with NTMs, and the most common manifestation of these infections in children is cervical lymphadenitis.³

This is a case of a teenage female who was managed for NTM in the University of Uyo Teaching Hospital.

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Case summary:

A seventeen-year old female who presented to the children's outpatient of the University of Uyo Teaching Hospital with complaints of multiple neck swellings, weight loss, and recurrent fever of eighteen months duration. Swelling was first noted behind the left ear and continued to increase in size

to extend to the left shoulder and to the other side of the neck. Swellings had ruptured repeatedly over the past year to release pus, leaving behind residual ulcers.

Weight loss was gradual in onset, progressively worsening with time, evidenced by loose clothes on the body and prominence of bones despite adequate appetite.

Fever was low grade, continuous, worse at night, associated with chills, rigor, and drenching night sweats.

She initially received oral medications from various patent medicine dealers at home for one month. When there was no improvement in her clinical state, she presented at a health center where retroviral screening for HIV and gene expert for TB was done. She was positive for both tests. At the health centre, she commenced anti-retroviral (Lamivudine/tenofovir/ dolutegravir) and anti-TB medications (Rifampicin, Isoniazid, Ethambutol, Pyrazinamide), which the patient took for up to a year. As the ulcers on the neck refused to heal, she was referred to our tertiary facility for proper management. She was sexually active and had up to three different sexual partners before the onset of illness. The patient is an orphan who had lost both parents, to protracted illnesses involving cough and weight loss. Her current caregiver is the younger brother of her late mother.

On presentation, she was wasted, mildly pale, with palpable multiple bilateral anterior and posterior cervical lymph nodes and left axillary lymph nodes each about 2cm in diameter. They were firm, painless, and matted together. She also had ulcers over the enlarged nodes, each measuring about 2cm in the lateral parts of the neck. There were also scars from previous healed ulcers on the lateral portion of both necks.

Two different gene experts repeated in this facility detected Mycobacterium with intermediate rifampicin resistance. TB medications were recommenced with oral antibiotics (Amoxicillin-Clavulanate). However, the ulcers on the neck did not resolve even after two months of regular intake of TB medications. A line probe assay was done suggesting a Non-Tuberculous Mycobacterium infection. On account of the above, the patient was commenced on oral Azithromycin 500mg daily, which she received for six months in addition to the

continuation phase of her TB medications (Rifampicin and Isoniazid). Affected lymph nodes were also excised, and histology revealed a granulomatous inflammation and features of scrofuloderma. A sample for TB culture was taken before initiation of treatment; however initial sample was lost in transit to the National Reference Centre. On commencement of Azithromycin the patient's clinical state improved markedly. All ulcers healed completely with a remarkable increase in weight. She was discharged from the TB clinic following completion of a one-year course of anti-TB medications and six months of oral Azithromycin. The patient is still receiving oral antiretroviral medications regularly at the primary health center and has been able to return to a normal life.

Discussion

NTMs are a large family of acid-fast bacteria different from the Mycobacterium Tuberculosis complex that are capable of causing severe diseases especially in immunosuppressed children.⁴ While NTM is common in older females, presence of HIV infection as seen in our index patient can increase its incidence in children.⁵

There are serious challenges in managing NTMs in resource-poor settings like ours where tuberculosis is endemic and there is wide BCG coverage.⁵ Since NTM causes similar illnesses as Mycobacterium Tuberculosis and initial affordable investigations like the Tuberculin Skin Test, Acid Fast Bacilli, and sputum/stool Gene Expert are all likely to show positive findings in both NTM infection and Mycobacterium Tuberculosis infection, differentiating both can be challenging and this was our experience in managing the index patient affirming what has been reported that most patients with NTM are categorized to have Mycobacterium Tuberculosis infection and are treated as such in the first instance.⁶

Studies done in Mozambique showed that 26% of children initially diagnosed to have tuberculosis actually had NTM⁷, while South Africa yielded 6%.⁸ Studies from adult populations in Nigeria showed that 17%⁹ and 15%⁶ in two different populations thought to have tuberculosis actually had NTMs. Our patient was initially diagnosed of TB adenitis and she had a full year's course of treatment for

same according the Nigeria's Program on TB management. Microbial cultures of two separate samples on both culture and liquid media, which is the gold standard of diagnosis of NTMs¹⁰ are hardly available in a resource-poor setting like ours. There is only one facility in the country with a laboratory for this service and its location is about twelve hours journey from our centre.

Just like our experience in the management of this patient, most patients with NTM's are usually identified when they continue to having positive smears despite adequate TB treatment and even then they are often categorized as having Multi Drug Resistant TB (MD-RTB) and they are often subjected to extreme treatment with second line TB medications which still remains inadequate.¹¹ Our patient still had a positive smear following complete treatment and was classified to have had treatment failure. She had TB treatment recommenced until the results of investigations for NTM was made available.

As seen in this patient; Cervical Lymphadenitis is the most common manifestation of NTM in children while adults usually have pulmonary manifestations.¹

NTM lymphadenitis has been staged 1-4, starting from the initial firm painless mass (stage 1) to liquefaction and a fluctuant mass (stage 2). The skin over the mass gradually changes colour and becomes thin (stage 3) with subsequent rupture and fistulisation (stage 4). Our patient had masses in all the above-named stages with multiple draining fistulae, healing fistulae, and newly forming masses.

The Gold standard for diagnosis for NTM is bacterial culture¹⁰. however this was not available in our Centre. Our patient had a positive gene expert for MTB with intermediate rifampicin resistance, and line probe assay done identified NTM but could not identify particular strains. An attempt to get a culture done at the country's reference lab was not without challenges and initial sample sent was lost in transit.

Surgical excision is the gold standard treatment choice in addition to antibiotic therapy with a combination that includes a macrolide (clarithromycin/Azithromycin), rifampicin and ethambutol.¹² Our patient had excision of affected lymph nodes with initiation phase of TB treatment

(Rifampicin, Isoniazid, Ethambutol and Pyrazinamide) for two months and continuation phase (Rifampicin, Isoniazid) and Tab Azithromycin 500mg daily for six months. She had a full recovery with complete resolution of symptoms and healing of all cervical fistulae.

Conclusion:

NTMs are ubiquitous in our environment, and immunosuppressed children are at an increased risk of infection. Diagnosis remains a challenge in resource-poor settings like ours and there are chances that children with NTMs are being treated as children with MD-RTB. The institution of more reference laboratories as well as developing more affordable and simple techniques for diagnosis will go a long way to reducing the burden of this illness.

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