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CASE REPORT

Pott's disease in a two year old: a consequence of failed contact tracing

Anikoh Sunday
Nwaneri Uchechukwu Damian
John Omua
Orbih Edmund
Sadoh Ayebo Evawere

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Sadoh Ayebo Evawere (✉)
Anikoh Sunday,
Nwaneri Uchechukwu Demian,
Orbih Edmund
Department of Child Health,
University of Benin Teaching Hospital, Benin City Nigeria
Email: evawere.sadoh@uniben.edu

John Omua
Department of Radiology, University of Benin Teaching Hospital, Benin City, Nigeria

Abstract: Tuberculosis of the spine (Pott's disease) has the potential for causing severe disability if not identified and treated early. Tuberculosis preventive therapy (TPT) is the standard of care for under-fives who have been in contact with an infectious case of tuberculosis but do not have tuberculosis. We report the case of a 2 year old child whose mother was managed for tuberculosis but was not given TPT and went onto develop tuberculosis of the spine.
She responded positively to antituberculosis therapy. We highlight the missed opportunity for TPT at various points of contact of this child with the health care system. We recommend the integration of services at primary health care level and the training/retraining of health care workers in TB care with specific emphasis on contact tracing/TPT. Health education for the general population on tuberculosis is also important.

Keywords: Pott's disease, contact tracing, tuberculosis preventive therapy

Introduction

Tuberculosis (TB) is the foremost infectious cause of death globally.[1]its resurgence globally has followed the HIV epidemic. In 2019 there were 1.4 million deaths from tuberculosis of which 230,000 were in children and 251,000 in people living with HIV.[1]TBis a multisystemic disease and can affect different organs including bone of which the spine is the commonest site of skeletal TB.[2-4]

Following exposure to an infectious case of TB, the *Mycobacterium tuberculosis*, the causative organism, remains dormant in the exposed persons who become infected causing a latent infection or it may cause active disease. The life time risk of developing disease is 5-10% in healthy persons.[5] Risk factors for developing disease include being an under-five, malnutrition, immune suppression and presence of underlying disease such as measles.[5,6]
TB is an airborne disease that is transmitted mostly from adults and adolescents to children and other persons. Children rarely transmit the infection. Thus, the standard of care for an adult or adolescent case of TB includes contact tracing.[6]Contact tracing is a systematic process for identifying previously undiagnosed cases of TB or latent infection among the contacts of an index case so that they can benefit from treatment or preventive therapy. [7]

For every contact identified, he/she is screened for the presence of TB and offered treatment if found to have the disease.[8] Child contacts are prioritized because children, especially under-fives have a higher risk of developing active TB disease, more rapid disease with the greatest risk for severe/disseminated disease associated with high morbidity and mortality.[8] Child contacts who screen negative for TB are placed on tuberculosis preventive therapy (TPT).[6,8] This has been documented to prevent progression of TB infection to disease. Various drug options and regimens for TPT are available.[8] In Nigeria Isoniazid at 10mg/kg as a daily dose is the regimen being utilized.

The effectiveness of TPT as a strategy to prevent TB depends on its uptake. In Nigeria it has been a perennial challenge to identify children with TB who should make up about 10-15% of total adult cases.[6] Currently only about 6% of estimated child TB cases are being identified and reported.[6] While the difficulty in making a diagnosis of TB in children is a contributor to the low identification of childhood TB cases, low uptake of contact tracing is another factor.[6]
This report is a case of a two-year- old girl whose mother was treated for pulmonary TB and had completed treatment but the index patient who was 3 months old at the time of the mother's diagnosis was not screened for TB neither was she placed on prophylaxis. She eventually presented at the age of 2 years with Pott's disease.
The aim of this report is to re-emphasize the importance of contact tracing and the use of TPT to prevent tuberculosis especially in under-fives.

Case presentation

A 2-year-old girl was admitted with complaints of inability to walk due to pain of 4-month duration and swelling over the lower back of 3-month duration with associated history of recurrent fever. There was no cough, weight loss, poor appetite or drenching night sweats.
Her mother was diagnosed with pulmonary tuberculosis when she was 3 months old and had completed 6 months treatment with anti-tuberculous drugs. The mother denied being offered screening or prophylaxis for her children.

Her pregnancy was booked at a private hospital at gestational age of three months. Delivery was normal. She was exclusively breast fed for six months while pap and adult diet were introduced after 6 months. As at the time of admission she was on adult diet. She received all the routine childhood immunizations (5 visits were made to the immunization clinic) however, the BCG scar was not seen. Also, there was no single weight measurement documented on the immunization card.
She is the second of two children in a monogamous marriage. The older sibling, a male 6 year old was alive and well. The family resided in a one room passage house that was not adequately ventilated. Her mother is a 30 year old trader with primary level of education and the father a 32 year old waste manager with secondary level of education.

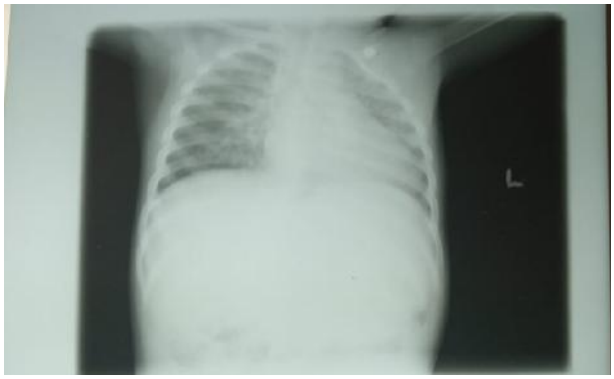
At admission she was ill looking. There was no fever, pallor, jaundice, digital clubbing and significant peripheral lymph node enlargement. She was not dehydrated. She weighed10 kg (83% of expected) and was stunted at a height of 73cm (83% of expected). Her occipito-frontal circumference was normal at 48 cm.
Gait could not be assessed because she was unable to walk. There was thoraco-lumbar kyphosis with a swelling over the 2nd and 3rd lumber vertebra which was hard but tender (See Figure 1). There was also no differential warmth or change in color of overlying skin.
The power in both lower limbs was assessed as grade 3/5 with depressed deep tendon reflexes in the lower limb; sensation (light and deep touch were normal in both lower limb). Both upper limbs were normal.
She was dyspneic (flaring of the alae nasi and mild intercostal recessions) with respiratory rate of 28 cycles/min. Her chest wall was symmetrical with equal chest expansion. Her trachea was central; percussion notes were resonant with normal area of hepatic and cardiac dullness and breath sounds were vesicular. Her pulse rate was 118beats/min, regular and of full volume. Her apex beat was located at the 4th left intercoastal space mid clavicular line and the heart sounds were normal; no murmur was heard.

Radiograph of the spine showed a gibbus deformity at L1 and L2 vertebral level. (See figure 2) There is lytic destruction of the body of L1, L2 and L3 vertebral bodies (more marked at L2 which show poorly defined anterior wedging), There is a complete obliteration of the L1/L2 disc space.
Chest radiograph shows bilateral perihilar opacities (Figure 3)
MTB was not detected on examination of gastric aspirate by Gene Xpert. Her Mantoux test reading was 7.5mm which was indeterminate. The Erythrocyte Sedimentation Rate was 53 mm/hr which is elevated. She had a leukocytosis (WBC -17000/µl) and mild anaemia at a haematocrit of 27.9%.
She was managed as a case of Pott's disease (tuberculosis of the spine) and pulmonary tuberculosis with two months of Rifampicin, Isoniazid, pyrazinamide and ethambutol in addition to ten months of Rifampicin and Isoniazid. She also had to wear a lumbar jacket as recommended by the orthopaedic surgeon. She had a good response as she regained her ability to walk after 4 months of therapy, gained weight(14kg at completion of antituberculosis therapy) and there was resolution of other symptoms. She however had a residual gibbus.
Her father and the older sibling screened negative for tuberculosis (no symptoms, chest Xray was normal and Xpert testing on stool was negative).

Fig 1: Picture with arrow showing gibbus on the back of child

Fig 2: Radiograph of the spine with arrows showing lytic destruction of the bodies of LI-3

Fig 3: Chest radiograph showing bilateral perihilar opacities



Discussion

TB of the spine is the commonest form of TB of the bone. The incidence is highest in sub Saharan Africa and south east Asia.[4] TB of the spine affects all age groups but in Nigeria and other developing countries it is more in children and young adults.[4,9] A series from Calabar reported that 56% of affected children were under the age of 5 years as in this case report.[10] Under-fives are known to bear a disproportionate burden of TB spine.

One of the tenets of prevention is early diagnosis and treatment. In the index case, she was not presented to the hospital when back pain started because of poor care seeking in her parents. An earlier feature of tuberculosis of the spine is back pain.[4] Also, the presence of back deformity as observed in this patient is due to delay in presentation. Delay in presentation and late identification /commencement of treatment results in complications which include parasthesias, radicular pain, hemiplegia, quadriparesis, quadriplegia and cold abscess which manifests with paraspinal swelling or retropharyngeal swelling, swelling in the anterior or posterior triangles or abdominal mass (the locations are dependent on the site of the bony lesion).[4] Poor care seeking and delay in presentation are major problems in different diseases in low and middle income countries.[8,11]

TB spine is treated with anti TB drugs with options for surgery. The indications for surgery include neurologic deficit, spinal deformity with instability or pain, no response to medical therapy (progressive kyphosis and large paraspinal abscess).[12] Surgical outcomes are said to be best during acute phase of the disease.[13] Children pose particular difficulties as they continue to grow which may worsen or improve the deformity.[13] In the index case conservative management was carried out with good outcome. A pronouncement on the definitive outcome can only be made though, when the child reaches adulthood. TB spine has good outcomes when detected early and treatment commenced.[4] However delay may result in permanent neurological sequelae such as paralysis.

Prophylaxis plays an important role in TB control so the failure of the health care system to recognize the need for prophylaxis in the infant of a mother with TB is a major highlight in this case. This child made several contacts with the health care system but the needful was not done. At the time of her mother's diagnosis if contact tracing was done she would have been identified as a high priority risk contact. She also received her immunizations from a health facility but her poor growth was not noticed as growth monitoring was not done. Failure to thrive is one of the key features of childhood tuberculosis. Growth monitoring and promotion are supposed to be carried out during immunization services. The errors that culminated in this child not getting the required prophylaxis underpin the need for integration of health care services and for all health care workers to be knowledgeable about common infections such as tuberculosis and the need for contact tracing when the diagnosis is made. It is also pertinent to note that contact tracing is indicated not only for adult index cases but also for children who are index cases where reverse contact tracing (source case investigation) is indicated.[14] This is geared towards identifying the source of tuberculosis for the child and possibly other unidentified cases including other children in the household. The benefits of contact tracing accrue at individual level where infected persons are identified early and receive treatment, at population level which results in breaking the transmission chain and at scientific level which enables study of risk factors, transmission mode and infectivity.[15]

The recent expansion of the target group of those to get prophylaxis is also important in the control effort for TB.[16] This will ensure the pool of persons who are infected with the potential for progression to disease and subsequent spread is reduced.

It is important to also study and identify the factors that contribute to the under diagnosis and underreporting of child TB cases. A potential cause is what played out in the index patient– failure of contact tracing. Contact tracing especially among vulnerable persons will need to be prioritized. Parents refusing TPT because they do not perceive their child to be at risk could result in prophylaxis not being carried out but this was not demonstrated in the case presented. Poor risk perception has been identified as a factor in poor uptake of critical interventions.[17]

Conclusion

There is a resurgence of TB due to the HIV pandemic and malnutrition especially in sub Saharan Africa Nigeria inclusive. This emphasizes the need for effective screening of all those that are exposed especially under-fives for early commencement of treatment of active disease and prompt prophylactic treatment of those with latent TB. Training and re training of health care workers on the need for contact tracing and preventive therapy for child contacts should be carried out urgently. General health education of communities about TB is

also necessary to enable early self and community referral to the health care system.

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