Clinical Diagnostic Dilemmas In Childhood Abdominal Tuberculosis: A Report Of Two Cases

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Summary: We report the cases of two children who presented with weight loss, pain and abdominal swelling of at least 3 weeks duration. The children presented separately at the children's emergency unit of the Ladoke Akintola University of Technology Teaching Hospital and the University Teaching Hospital, Ado - Ekiti. Both children presented with fever and had no history of ingestion of unpasteurized milk or contact with any one with features suggestive of tuberculosis. Examination revealed chronically ill-looking children, with abdominal masses and significant generalized lymph node enlargement. A diagnosis of typhoid perforation was made in one child and abdominal malignancy in the other and both were planned for surgery. Both patients were however successfully managed on oral anti-tuberculous drugs after further review by specialist paediatricians. The cases are reported with a view to providing information that can improve the diagnostic acumen of practicing physicians confronted with similar conditions in resource-constrained settings.

Key words: Paediatric, abdominal tuberculosis, diagnostic and dilemma

Introduction

Tuberculosis remains a common cause of morbidity and mortality in the developing countries and pulmonary tuberculosis is the most common mode of presentation among individuals with the disease.¹⁻³ Abdominal tuberculosis can occur from swallowing infected secretions from the respiratory tract or ingestion of infected unpasteurized milk containing mycobacterium organisms.⁴ Abdominal tuberculosis is often difficult to diagnose, particularly when there is no obvious evidence of disease elsewhere in the body.⁵ This is because abdominal tuberculosis is often insidious in onset and has protean manifestations which can mimic other conditions such as abdominal lymphoma, protein energy malnutrition and liver cirrhosis.⁶ The diagnosis of pulmonary and abdominal tuberculosis in children is often difficult because they may present with non-specific features. Furthermore clinical diagnosis based on signs and symptoms lacks specificity and sensitivity.⁶ Ancillary investigations do not necessarily ensure or make the diagnosis of tuberculosis easy. Tuberculin skin sensitivity tests such as the mantoux, Heaf and Tine test lack specificity and sensitivity. A more sensitive and specific test such as polymerase chain reaction (PCR) is either not available or affordable in many developing countries. Culture of infected body fluids is the gold standard for the diagnosis of tuberculosis; however, the
lengthy period needed to obtain the result of this investigation serves as a major hindrance to its use in clinical practice. The yield from microscopy of secretions such as sputum, gastric washings and ascitic fluid in children, for *Mycobacterium bacilli* has been found to be low in previous studies. Furthermore, children rarely produce sputum.

Plain chest radiographs may sometimes be helpful in making a diagnosis of abdominal tuberculosis, when patients with concomitant pulmonary tuberculosis show radiological evidence of the infection. Plain abdominal radiographs and ultrasound also have a low specificity and sensitivity. Thus, diagnosing abdominal tuberculosis is a herculean task in children from developing countries.

**Case report 1**

A 12 year old boy presented at the Paediatric Emergency unit of Ladoke Akintola University of Technology Teaching Hospital, Osogbo on the 28th of December 2008. He presented with 5 months history of weight loss, 4 months history of fever and 2 months history of abdominal discomfort. The loss of weight was not quickly detected by the parents because the patient was well built prior to this illness. Further questioning revealed that the fever was continuous and associated with chills. Abdominal pain was described as colicky and aching. There was no history of diarrhoea or vomiting, although the patient had not moved his bowels for four days prior to admission. The patient had no history of ingestion of unpasteurized milk or contact with anyone with features suggestive of tuberculosis. He was fully immunized according to the National Programme on Immunization.

General examination revealed a conscious chronically ill looking and wasted boy with a weight of 35.0 kg which was 88.6% of the expected for the age. There was no pallor, jaundice or cyanosis but both axillary groups of lymph nodes were significantly enlarged. Abdominal examination revealed fullness and distension with an oval mass in the left para-umbilical region measuring 6 by 8cm and tenderness in the right lumbar region. A smaller superficial mass was also felt in the right para-umbilical area. The bowel sounds were normal. No other abnormalities were detected on examination of other systems of the body. Based on these features a diagnosis of abdominal tuberculosis was made with differentials of abdominal malignancies and remote possibility of typhoid enteritis.

Haemograms revealed a packed cell volume of 29%, white blood count of 8,700/mm³ with differentials of 64% neutrophils, 29% lymphocytes, 5% monocytes and 2% eosinophils. The film appearance was reported as normal. An elevated erythrocyte sedimentation rate (ESR) of 75mm/hr was obtained and the retroviral screen was negative. The electrolytes and urea and the liver function tests were normal. A serial investigation of the sputum and gastric washing for acid fast bacilli was negative. Radiology tests revealed normal plain chest and abdominal radiographs while the abdominal ultrasound showed para-vertebral and para-aortic masses. Fine needle aspiration of the abdominal mass for cytology was not done because of the closeness of the masses to the aorta.

The patient was initially placed on intravenous ciprofloxacin at admission. However the fever persisted and the child kept on complaining of abdominal pains despite additional symptomatic treatment with oral paracetamol. Since no form of tuberculin material was available, the BCG vaccine was administered one week after admission to elicit a reaction, as additional support for the diagnosis of tuberculosis. An accelerated BCG reaction, manifesting as a palpable induration which rapidly
evolved to an ulcerated lesion was obtained 48 hours after administration. The patient was there after started on direct observation anti tuberculous therapy short course. He received daily doses of rifampicin, isoniazid, pyrazinamide and ethambutol initially for two months as the intensive phase of treatment and rifampicin and isoniazid for 4 months as the continuation phase of treatment in doses adequate for the age. He made remarkable improvement over the next 2 weeks as the abdominal pain subsided within a week of anti-tuberculous therapy. The fever subsided within 72 hours of therapy and the weight increased from 32 to 40 kg over the next 2 months. A repeat ultrasound two months after the first examination showed that the initial para-aortic masses had slightly regressed. The patient was subsequently discharged to the Paediatric Outpatient clinic for follow-up and completion of the course of anti-tuberculous drugs. Further improvements recorded at follow-up include resolution of all symptoms and further weight gain to 47 kg over the treatment period.

Case report 2

A 6 year old boy presented at the Paediatric Emergency Unit of University Teaching Hospital, Ado-Ekiti with a five week history of occasional cough which was reported to have been treated successfully at a private hospital with a two week medication of unknown drugs obtained from a pharmaceutical shop. Three weeks prior to presentation, the patient presented with a history of progressive abdominal swelling and pain. The abdominal swelling was noticed in the central upper portion of the abdomen and was associated with pain. There were no aggravating or relieving factors and he had been constipated for one week prior to presentation. The patient also gave a three week history of poorly characterized fever and weight loss, although his parents stated that the patient was well sized or big compared to his peers before the illness. There had been no contact with anybody having a history suggestive of tuberculosis. There was no history of ingestion of unpasteurized milk. Examination at presentation revealed a conscious but wasted child with a weight of 15 kg which was 83.3% of the expected. The axillary and inguinal lymph nodes were significantly enlarged. There was no pallor, fever, jaundice or dehydration and the significant findings on systemic examination were in the abdomen. Oval tender firm masses were found in the left lumbar and the left aspect of the hypogastric region. The masses measured 8 by 6 cm in their longest dimensions. No liver or kidney enlargements were discovered although the spleen was enlarged by 4 cm below the left costal margin. An assessment of abdominal malignancy was made with a differential of abdominal tuberculosis. The patient was referred to the surgical unit after ordering a complete blood count, erythrocyte sedimentation rate, retroviral screening and abdominal ultrasound.

The results of the investigations showed a packed cell volume of 29% and the total white cell count of 9,800/mm³, with differential lymphocyte and neutrophil counts of 68 and 32 percent respectively. The ESR was 5 mm/hr (Westergreen) and the retroviral screening for HIV was negative. The electrolytes, urea, creatinine and urinalysis results were normal. Abdominal ultrasound results showed a uniform encapsulated mass above the bladder measuring 96 by 41 mm and another mass measuring 46 by 98 mm around the left kidney with a clearly delineated capsule. There were no liver or kidney abnormalities or ascites. Plain abdominal radiographs also showed no abnormalities. Based on these findings a diagnosis of abdominal lymphoma
was made with abdominal tuberculosis as a differential. It was felt that the patient might need an exploratory laparatomy to clinch the diagnosis. On further review by a consultant paediatrician a diagnosis of abdominal and pulmonary tuberculosis was made; based on clinical features together with hilar shadows seen on a freshly ordered plain chest radiograph (Figure 1). Fine needle aspiration or excision biopsy and cytology of the lymph node was not done because of financial constraints. The Mantoux reagent was not available and a BCG vaccination was administered to the patient. An indurated lesion which rapidly progressed to an ulcerative lesion at the vaccination site was observed less than 48 hours after BCG administration. The patient was managed using the directly observed anti tuberculous therapy short course. He was given rifampicin, isoniazid, ethambutol and pyrazinamide daily for the initial two months intensive phase and rifampicin and isoniazid for the 4 month continuation phase. The clinical response was good. Regression in the size of the para-aortic masses was confirmed by ultrasound examination. The patient's weight progressively increased from 15 to 20 kg after 2 months of follow up. Resolution of all the complaints had occurred during the intensive phase of treatment.

Discussion

Tuberculosis remains a major cause of morbidity and mortality worldwide and it is the most common cause of death from a single infectious disease particularly in children. To reverse the toll from tuberculosis there is a need to institute effective preventive and prompt curative strategies. The diagnosis of tuberculosis is a necessary initial step preceding cure. However, the diagnosis of both pulmonary and abdominal tuberculosis has been found to be difficult in children. This may explain why the diagnosis of abdominal tuberculosis in both cases was initially missed and why the attending doctors opted for surgical intervention.

The diagnosis of abdominal tuberculosis is relatively easy in children with concomitant pulmonary disease especially when the patient presents with clinical overt features of tuberculosis or when there are pulmonary radiological findings consistent with tuberculosis. In the absence of these features, the diagnosis of abdominal tuberculosis can be tasking. Attending doctors may have to rely on their clinical acumen, or a series of tests.

Most of the very sensitive and specific tests such as the polymerase reaction and tests that measure Interferon Gamma Released Assay's (IGRA's) are expensive and not available. They depend on high infra-structured or supra-structured technology laboratories. The IGRA's measure the production of interferon gamma by mononuclear cells using early secretion antigen target (ESAT 6) and culture filtrate protein (CFP 10). The latter two antigens are only specifically present in Mycobacterium tuberculosis infections and not the vaccine. Quantiferon Gold and T spot are examples of commercially available IGRA's that may be found in some resource-limited regions. Less expensive tests such as tuberculin tests lack sensitivity and specificity thus leaving TB patients in resource limited settings with poor access to good diagnostics and often only access to poor diagnostics. Even tuberculin materials may sometimes be unavailable in such areas.

Plain radiographs and ultrasound of the abdomen, though relatively more available, often give poor specificity and sensitivity results in the diagnosis of abdominal tuberculosis. The computerized tomography scan is also an expensive investigation. It has been found useful in the investigation of abdominal tuberculosis. Although it is not specific, it
reveals asymmetric thickening and enlarged lymph nodes with low attenuation in patients with tuberculous ileitis. Computerized tomography was not considered for these patients because of cost and unavailability.

Other non-surgical modalities that may be helpful in the diagnosis of patients with suspected abdominal tuberculosis include; endoscopy and barium studies. For these it is advisable for patients with abdominal tuberculosis to be investigated combining colonoscopy with biopsy and histology of the biopsied tissue. Previous studies that combined these two modalities recorded a positive yield above 80 percent. Endoscopy was not conducted in the two patients because the hospitals where treatment was obtained lacked the equipment and the personnel to do these procedures.

Laparatomy and laparascopy in cases of abdominal tuberculosis usually reveal involvement of the intestines, peritonitis or lymphadenitis. They may be indicated in complicated cases, for obtaining diagnostic samples such as ascitic fluid, lymph nodes or gut tissue or for relieving obstruction, which was not the case in the two patients presented. Ascites is a common finding in adults and its analysis may be helpful. A previous study on abdominal tuberculosis in adults showed that the PCR analysis of the ascitic fluid was positive for Mycobacterium tuberculosis in all cases. However, ascites is not a common feature of tuberculosis in children. It is therefore advisable to look for other ways of diagnosing abdominal tuberculosis in suspected cases. The two cases presented did not have ascites. Fine needle aspiration and cytology of the appropriate tissue may also help in making a correct diagnosis when the appropriate infected tissues are accessible. The affected abdominal lymph nodes were not safely located for biopsy or aspiration in the present cases.

A therapeutic trial of anti-tuberculosis drugs may be indicated when financial constraints prevent carrying out the conventional investigations or when TB diagnostics are unavailable or give inconclusive results in suspected cases. In our two cases, the weight of evidence suggested the diagnosis of abdominal tuberculosis. The response to anti-tuberculous medications, in terms of weight gain and resolution of the fever, abdominal swelling and pain gave support to the correctness of our diagnosis. Regressions in the sizes of the lymph nodes were however, noted to be slow in both cases presented. Previous studies have also documented a slow regression in the size of lymph nodes among individuals on anti-tuberculous therapy with lymph node involvement.

Normally a papule develops 2-3 weeks after proper administration of BCG at the site of vaccination, this slowly increases to a 4-8mm swelling at 5 weeks, eventually healing spontaneously with a ulcerated crust or scar of 4-8mm within 6 - 12 weeks. An accelerated BCG reaction was obtained in the two cases presented. It was administered as an alternative to tuberculin tests, which were unavailable. This alternative tool is also known as the BCG test and it has been stated to be useful in the diagnosis of tuberculosis. Two previous studies have shown that the BCG test gives a higher yield compared to the Mantoux test. Sreeramareddy et al recorded positive yields above 92 percent for both pulmonary and extra-pulmonary forms of tuberculosis in their study of Indian children. In conclusion, the diagnosis of abdominal tuberculosis is difficult in children and a high index of suspicion is required of doctors attending to them. Conventional methods of investigating tuberculosis such as plain chest and abdominal radiographs, CT,
ultrasound and analysis of the ascitic fluid, should be done when possible. Abdominal tuberculosis should be ruled out before surgical intervention in children presenting with abdominal masses and discomfort. In cases where the Mantoux reagent is unavailable, the BCG test may serve as an alternative investigative tool for diagnosis, since it is readily available, cheap and has a high yield.

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