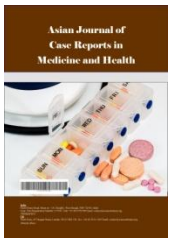


Asian Journal of Case Reports in Medicine and Health

8(4): 8-14, 2022; Article no.AJCRMH.92554

Risk Factors and Diagnositic Challenges of Abdominal Tuberculosis: A Case Report

Diri, Robert Ogbodede [a], Amadi, Ekechi Stella [b*], Agbarakwe, Blessing [a], Amaewhule, Mary Nneda [b], Aprioku, Esther [a], Nonju, Tamunobarabiye [b], Nwamadi, Christian Chisom [a], Rotifa, Oluwafemi [a] and Wakama, Rita [a]

[a] Dermatology and Pulmonology Unit, Rivers State University Teaching Hospital, Harley Street Old GRA Port Harcourt, Rivers State, Nigeria.
[b] Dermatology and Pulmonology Unit, Rivers State University Teaching Hospital, Harley Street Old GRA Port Harcourt, Rivers State / College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/92554

Case Study

Received 21 August 2022
Accepted 26 October 2022
Published 02 November 2022

ABSTRACT

This is a case of a 30 year old female who presented with a 4 month history of progressive abdominal swelling and mild abdominal discomfort. She had a past history of poorly treated pulmonary tuberculosis however during current symptoms the usual screening tests for tuberculosis such as the gene-xpert test, chest radiograph and acid-alcohol fast bacilli smear and culture were negative creating a diagnostic challenge and considerations for alternative diagnosis to abdominal tuberculosis. Other supportive evidence and risk factors for abdominal tuberculosis were sought for. The treatment was initiated when other likely diagnoses were excluded. Patient made remarkable improvement after starting anti-Koch's therapy.

Keywords: Abdominal; challenges; diagnostic; risk factors; tuberculosis.

**Corresponding author: E-mail: ekechiamadi@yahoo.com;*

1. INTRODUCTION

Abdominal tuberculosis is one of the extra pulmonary manifestations of tuberculosis. It is caused by the mycobacterium tuberculosis complex that includes *Mycobacterium africanum*, *M. bovis, M caneitti, M.microti and M.tuberculosis* [1]. The prevalence of abdominal tuberculosis is said to be 1-3% worldwide [2]. There are various hospital estimates of prevalence across the world with the homeless, residents of long-term care facilities, prisoners and the immunocompromised being most vulnerable [2-6]. Nigeria is noted to be one of the countries with a high burden of abdominal tuberculosis [6]. Abdominal tuberculosis is noted to make up to 11% of the extra-pulmonary tuberculosis (EXPTB) cases [7, 8].

2. CASE PRESENTATION

A 30 year married female who was referred to the Pulmonology unit with complains of abdominal swelling of 4 months duration with associated history of moderate abdominal discomfort but had no swelling in any other part of the body. There was associated history of easy satiety and low grade fever. There were no gastrointestinal, pulmonary or other systemic symptoms during the current presentation. She had a past history of cough productive of non-foul smelling whitish sputum, low grade fever, anorexia and drenching night sweat, 9 months prior to current complains she was diagnosed as pulmonary tuberculosis following a chest radiograph that showed patchy opacities in lung fields although gene-xpert was negative. She commenced anti-Koch's treatment for two months but stopped due to generalized persisted joint pains following intake of the anti-Koch's medication. Her last menstrual period was a week prior to presentation. There was no history of consumption of unpasteurized milk. There was no history of exposure to anyone with chronic cough. She doesn't consume tobacco products in any form or take alcoholic beverages. She lived in a 3 bedroom flat with good ventilation in all rooms with her husband and 3 children.

Initial clinical diagnosis that was made on outpatient basis by the Gastroenterology team was of decompensated chronic liver disease (CLD) to rule out(r/o) abdominal TB, r/o ovarian cancer. Investigations including gene-xpert, acid fast bacilli smear and culture and abdominal ultrasound scan which was requested for was not immediately done. She later presented a week later to the Accident and Emergency (A & E) where urea breathe test for ***Helicobacter pylori*** and faecal occult blood were both positive. A diagnosis of dyspepsia on background abdominal ascites to rule out ovarian malignancy was made and she was placed on amoxicillin / clarithromycin / rabeprazole combination therapy. She declined admission into the ward and was lost to follow up for the next two months. She later represented to A& E where she was seen and referred to the Gastroenterology clinic. Following a provisional diagnosis of decompensated CLD to r/o differential diagnoses of abdominal tuberculosis and ovarian cancer; she was then placed on oral spironolactone 25mg daily, carvedilol 3.125mg b.d livolin forte 1 Tab b. d tablets for a week; was asked to do the initial requested investigations and counseled on the need to be admitted into the hospital. She still declined in- patient hospital admission due to concern for her young children that she has to leave at home without any other care giver. Few days later on worsening of symptoms she went to the Obstetrics and Gynaecology (O&G) clinic where gynaecological malignancy was ruled out clinically and abdominal tuberculosis was strongly considered. She subsequently accepted to be admitted into the internal medicine inpatient wards.

Physical Examination revealed that patient was underweight with Body Mass Index (BMI) of 16.3kg/m^2 and febrile with temperature of 38.0°C with no peripheral lymphadenopathy; no pedal oedema and no stigmata of chronic liver disease. She had tachycardia. Abdomen moved with respiration and was uniformly distended, umbilicus was everted, and there were no visible umbilical veins. Abdominal girth was 96cm at the level of the umbilicus; it was doughy with periumbilical tenderness and there was no palpable organomegaly. Ascites was demonstrable by shifting dullness and bowel sounds reduced. Other systemic examination was unremarkable.

While on admission the following investigations were carried out; the results are shown as **below** in Table 1. Other investigations were uurinalysis which was normal while urine m/c/s showed no growth of any organism. No ova of any parasitic infection were seen on stool m/c/s. Liver function tests, fasting blood sugar and glycated haemoglobin were within normal limits. Therapeutic anti-Koch's therapy was strongly considered. The Directly Observed Treatment Short course (DOTS) team was informed of the case. The results of the Mantoux and ascitic fluid

adenosine deaminase were elevated. This made the decision to commence and continue therapeutic anti-Koch's stronger. The initiation phase was instituted with daily oral tablets rifampicin, isoniazid, pyrazinamide and ethambutol for the first two months and to continue with rifampicin and isoniazid for the next seven months with pyridoxine. Other adjunct therapy such as multivitamins, anti-helminthic and analgesic was also prescribed as required. Patient subsequently improved as monitoring chart showed decrease in abdominal girth, weight, pulse rate, temperature and ESR after a week after commencement of Anti-Koch's therapy. There was initial reduction in weight due to loss of ascitic fluid and regain of actual muscle mass, resolved tachycardia to normal. The ESR became high initially after treatment but it gradually decreased to the normal limit. She had lost weight as a result of the resolution of the ascites however she did not gain much after other parameters such as fever has resolved and ESR normalized. She confessed to have always been a very thin person and does not like to eat much since childhood during her follow up visits. Her BMI was 17.1 kg/m^2. Patient was counselled on the importance of weight gain and the risk of a low BMI in relation to the risk of tuberculosis. She was referred to the dietician to implement weight gaining diet as well to the primary DOTS care centre after the initial follow up visits at the pulmonary clinic.

3. DISCUSSION

This is a case of a Nigerian female patient who presented with abdominal tuberculosis. Abdominal TB was suspected as a differential from the onset as Nigeria is known to be one of the countries with a high prevalence of TB [6]. It is known globally that tuberculosis is twice as much as in men than women which the reasons have not been fully understood but it has been attributed to the socioeconomic and cultural factors related to exposure as well as biological mechanisms [9]. Extra-pulmonary tuberculosis particularly abdominal tuberculosis has been noted to be more common in females. The reasons are not clearly understood and this may as well be related to biological and socio-cultural differences [10,11]. The exact gender differences have not been established in Nigeria however two studies with larger number of cases done retrospectively revealed women to have higher prevalence of abdominal tuberculosis [12,13].

A study done in Russia showed a reverse with more males being three times more affected with abdominal tuberculosis while studies done in South Korea and India showed slightly more males when compared to females [3, 4, 5].

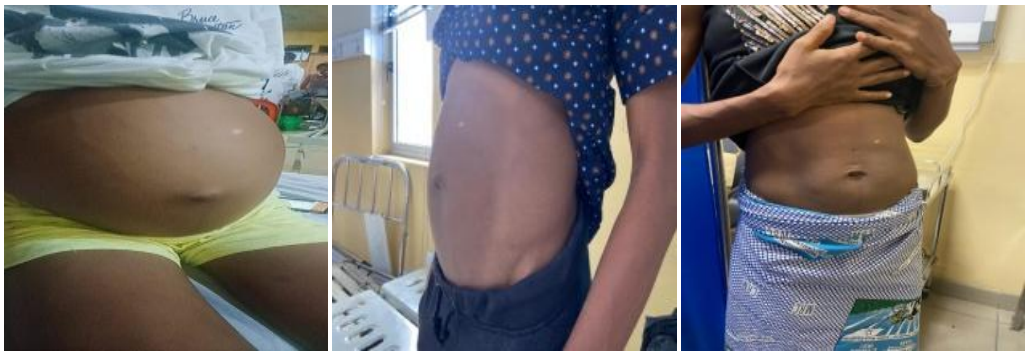
This patient falls into the modal age group in which of the cases of abdominal tuberculosis was seen [12, 13]. It is known that those at extremes of age are more susceptible to respiratory infections including tuberculosis. This might be as a result of the demographics of Nigeria as a country where more persons fall within the younger demographics.

The past history of poorly treated pulmonary TB is the strongest risk factor for development of abdominal TB in this patient. It would have been thought that she would have developed resistance after being on the drug for only a 2 month period however this was not so from the result of the gene-xpert test which also detects rifampicin resistance. This actually creates the dilemma if this was a case of a reinfection, reactivation or partial resistance. It is known that those with pulmonary TB can also have extra-pulmonary manifestation. At the time of having the pulmonary symptoms she had no extrapulmonary manifestations. While when she had abdominal symptoms she had no respiratory symptoms. The time lag between these two systemic manifestations was 9 months. Accurate diagnosis was needed in this case because treatment would require prolonged antibiotics and the possibility of occurrence of side effects that may impair compliance and lead to antibiotic resistance. The patient may also loose confidence in the health care system if there was no certain proof that the cause of her previous illness (**atypical pneumonia)** was the same as the cause of the **abdominal swelling which is *Mycobacterium tuberculosis***. Other studies have shown that pulmonary tuberculosis is also a risk for having abdominal tuberculosis, although the prevalence of co-existent pulmonary TB was variable as seen in the studies Russia(86.7%), South Korea(9.4%), India(22%) and Nigeria (27.7%) [3, 4, 5, 13] Globally it ranges from 6-38% [14].

Another risk factor for tuberculosis noted in this patient was being underweight. She had lost weight as a result of the resolution of the ascites however she did not gain much after other parameters such as fever has resolved and ESR normalized. She admitted to have always been a very thin person and does not like to eat much since childhood during her follow up visits. Low BMI has been associated with increased risk of having TB and a high TB mortality [15, 16].

Table 1. Investigations and results

No.	Investigation	Result(Normal value)	Remarks
1	Ascitic fluid macroscopy, microscopy culture and sensitivity(m/c/s)	Serosanguinous, No growth of mycobacterium tuberculosis	Negative but likely an exudate
2	Ascitic fluid Gene-Xpert test	Mycobacterium tuberculosis(MTB) not detected	Negative
3	Ascitic fluid cytology	There was absence of atypical inflammatory cells	Not suggestive of malignancy
4	Ascitic fluid biochemistry	Protein 57g/l (62-80g/l) , Glucose was 2.3mmol/l (4.2/6.4mmol/l)	Decreased Decreased
5	Ascitic fluid adenosine deaminase	87 IU//L (0- 30IU/L)	Elevated
6	Sputum Acid fast bacilli smear and culture	No growth of mycobacterium tuberculosis	Negative
7	Sputum Gene-Xpert test	(MTB) not detected	Negative
8	Full blood count	PCV was 36% (40-54%) WBC count was 5.2x10^9/L(4.8-10.8X 10^9/L) Neutrophil- 53% (40-75) Lymphocytes-28% (20-45%) Mono/baso/eosinophils- 19%(1-6) Platelet was 334 x10^9/L (140-400X 10^9/L)	Decreased, Normal, Likely eosinophilia
9	Erythrocyte Sedimentation Rate(ESR)	37mm/hr(5-7mm/hr)- *Pre Anti-Koch's therapy* 67mm/hr	Elevated
10	Serology	Retroviral screen Hepatitis B surface antigen Hepatitis C antibody	Negative to HIV I/II Sero-negative Sero-negative
11	Chest X- ray	No patchy opacities, areas of consolidation or pleural effusion seen	Normal
12	Abdominal Scan	Debritic ascites, No matted bowel loops or loculated collection	Most likely wet type peritonitis
13	Mantoux	17mm(< 5mm)	Most likely tuberculosis



A -Pre Anti Koch's **B -1 week after** **C- 2 weeks after discharge**

Fig. 1 A-C. Progressive response characterized by resolution of ascites

Risk factors generally for tuberculosis include immunodeficiency states such as Human Immunodeficiency Virus, diabetes mellitus, transplant patients, malignancy, immigration,

restricted and overcrowded residential living such as prisons, nursing homes and unemployment [3, 4, 5, 8]. This index patient did not fall into any one of these categories. She was sero-negative to both HIV I and II. The percentage of those with HIV /Abdominal TB infection is variable as seen in studies of different population. The studies done in Russia, South Korea, India, Benin, Nigeria and Ile-Ife, Nigeria showed the prevalence rates of HIV/Abdominal rates to be 14.3-33-3% (within the four year period), 1.4 %, 5%, 6.3% and 6.4% respectively [3,4,5,6,14]. This patient was an undergraduate student and mother of young children; this may have predisposed her to be stressed on most days of the week. Stress has a multiple relationship with regards to tuberculosis. Stress can be a risk factor for tuberculosis since it may reduce immune function and predispose patient to tuberculosis [17]. Psychological stress has been noted to be high during treatment with anti-tuberculosis treatment and during follow up periods. At baseline, past TB treatment history as it was in this index patient, being on anti-TB and anti-HIV treatments, being unmarried, low socio economic status and having symptoms of alcohol use disorder were associated with psychological distress. Low socioeconomic status during follow up period was the factor associated with psychological stress [18]. The *mycobacterium tuberculosis* is known to be affected by its own stress. Tuberculosis bacteria have evolved to remember stressful encounters and react quickly to future stress. This allows the bacteria to go into a dormant state making it difficult for it to be destroyed by the human body's immune system [19].

In making diagnosis of tuberculosis, the gene-xpert was negative using sputum and ascitic fluid samples.Gene - xpert test is a Cartridge Based Nucleic Acid Amplification Test (CBNAT) which is sensitive for diagnosing tuberculosis. A systemic review showed a pooled sensitivity of 88% and a pooled specificity of 98% for the diagnosis of pulmonary tuberculosis [20]. Another study assessed the convenience of a gene-xpert assay in Extra Pulmonary TB and showed an 81.3% sensitivity and 99.8% specificity, considering culture and clinical diagnosis as the gold standard [21]. Despite this high sensitivity and specificity it has been noted that the sensitivity is influenced by the method of sample collection particular that of sputum collection [22]. Other studies have shown that gene-xpert may not be so sensitive using ascitic fluid, with sensitivity being as low as 30% [23, 24, 25]. The use of acid fast bacilli culture using body fluids have been noted to have poor yield hence the use of body fluid adenosine deaminase **(ADA)** which has been shown to be more sensitive and specific [26, 27, 28]. It is also important to note that ADA can also be elevated in liver disease and HIV positive patients , notwithstanding, it still has a high sensitivity of detecting peritoneal TB, as high as 90% as it was in this index patient [28]. The method of sample collection for proper histologic and pathologic diagnosis of wet peritonitis type ,of abdominal TB the category which this patient falls into, has also been noted to be improved by carrying out an ultrasound-guided aspiration followed by laparoscopy if needed [2, 23]. The possibility of having a non-tuberculosis mycobacterium as the cause of the symptoms may also be the reason for the negative results of the gene-xpert, acid fast bacilli smear and culture as seen in this patient; however it is more likely to affect the older age group who are prone to bronchiectasis, chronic obstructive pulmonary disease and other structural lung diseases. The response to conventional treatment of managing PTB is poor unlike the response which this patient had [25, 29].

In the management of TB contact tracing and adherence to therapy are two key steps in prevention of spread. This patient had poor adherence to therapy when she had pulmonary tuberculosis and this may have resulted in a dissemination of the bacilli and placed her at the risk of development of TB drug resistance [30]. This patient was fortunate to have responded to the primary TB treatment regimen just as the case of abdominal TB reported within similar region [8]. The treatment was successful as most likely she has not developed resistance to the drugs. DOTS is a key component of managing patients with tuberculosis in the community as it is recommended [8, 30]. Continuous counseling on adherence to drugs and possible complications; reassessment and monitoring is advocated for [9, 30]. Quality of life assessments is equally being advocated for in whole being assessment of patients [18]. It is important that other differential diagnosis of abdominal ascites is ruled out such as malignant ascites which has a poor prognosis and is very challenging to treat.

4. CONCLUSION

Abdominal tuberculosis has different presentations and can mimic other diseases of the gastrointestinal system. A high index of suspicion is required to make accurate diagnosis

of abdominal tuberculosis. Currently diagnosis of abdominal tuberculosis is usually from a combination of clinical, radiologic, endoscopic, microbiologic, histologic, and molecular techniques. A simple cost-effective diagnostic laboratory test that can be used routinely for abdominal tuberculosis is not yet available. A global awareness has to be made about the peculiarities in the risk factors and diagnosis of abdominal tuberculosis which varies from that of pulmonary tuberculosis nevertheless have the same treatment modality.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Sousa MD, Batista J, Pacheco P, Nunes V. Abdominal tuberculosis: an old disease surprising young doctors. BMJ Case Rep; 2016.
2. Sheer TA, Coyle WJ. Gastrointestinal tuberculosis. Curr Gastroenterol Rep. 2003;5(4):273-8.
3. Skopin MS, Batyrov FA, Kornilova ZKh. The prevalence of abdominal tuberculosis and the specific features of its detection. Probl Tuberk Bolezn Legk. Russian. 2007;(1):22-6.
4. Cho JK et al. Clinical features and outcomes of abdominal tuberculosis in southeastern Korea: 12 years of experience. BMC Infect Dis. 2018;18:699.
5. Urabinahatti KA et al. Abdominal tuberculosis: an epidemiological profile and management of 40 cases in a tertiary set up. Int Surg J. 2016;3:1502-8.
6. Affusim CC, Kesieme E, Abah VO. The pattern of presentation and prevalence of tuberculosis in HIV-Seropositive patients seen at Benin City, Nigeria. ISRN Pulmonology; 2012. Article ID 326572
7. Anonymous. Management of non-respiratory tuberculosis. The Lancet. 1968;1:1423-4.
8. Edafe AE, Alasia DD, Akpa MR. Abdominal tuberculosis mimicking intra-abdominal malignancy: a case report. The Nigerian Health Journal. 2015;15(4).
9. Ferreira C, Pinto T, Neves I, Duarte R. Gender differences in active tuberculosis. European Respiratory Journal. 2014;44:P2688.
10. Ben Jmaa M, Ben Ayed H, Koubaa M, Hammami F, Damak J, Ben Jemaa M. Is there gender inequality in the epidemiological profile of tuberculosis? Tunis Med. 2020;98(3):232-240.
11. Jemaa MB et al. 762 sex differences in the epidemiology of tuberculosis in Tunisia. Open Forum Infectious Diseases. 2018; 5(suppl_1):S274.
12. Ihekwaba FN. Abdominal tuberculosis: a study of 881 cases. J R Coll Surg Edinb. 1993;38(5):293-5.
13. Akinkuolie AA, Adisa AO, Agbakwuru EA, Egharevba PA, Adesunkanmi AR. Abdominal tuberculosis in a Nigerian teaching hospital. Afr J Med Med Sci. 2008;37(3):225-9.
14. Chakinala RC, Khatri AM. Gastrointestinal tuberculosis.
Available:
:https://www.ncbi.nlm.nih.gov/books/NBK556115/
Accessed (10-09-2022).
15. Yen YF et al. Association of body mass index with tuberculosis mortality: A population-based follow-up study. Medicine (Baltimore). 2016;95(1).
16. Kitonsa PJ et al. Evaluation of underweight status may improve identification of the highest-risk patients during outpatient evaluation for pulmonary tuberculosis. PLoS ONE. 2020;15(12): e0243542.
17. Lerner BH. Can stress cause disease? Revisiting the tuberculosis research of Thomas Holmes, 1949-1961. Ann Intern Med. 1996;124(7):673-80.
18. Tola HH et al. Psychological distress and its effect on tuberculosis treatment outcomes in Ethiopia. Glob Health Action; 2015.
19. Rice University. Study could explain tuberculosis bacteria paradox. Science daily.

Available:https://www.sciencedaily.com/releases/2021/02/210222124608.htm, Accessed (22-10-2022)
20. Steingart KR, Sohn H, Schiller I, Kloda LA, Boehme CC, Pai M, Dendukuri N. Xpert® MTB/RIF assay for pulmonary tuberculosis and rifampicin resistance in adults; 2018. Available: https://www.ncbi.nlm.nih.gov/pubmed/24448973 Cochrane Database Syst Rev. 2013 1:9593
21. Tortoli E et al. Clinical validation of Xpert MTB/RIF for the diagnosis of extrapulmonary tuberculosis. Eur Respir J. 2012;40:442–447.
22. Meyer A et al. Sputum quality and diagnostic performance of Gene Xpert MTB/RIF among smear-negative adults with presumed tuberculosis in Uganda. PLoS One. 2017;12(7):e0180572.
23. Abu-Zidan FM, Sheek-Hussein M. Diagnosis of abdominal tuberculosis: lessons learned over 30 years: pectoral assay. World J Emerg Surg. 2019;14:33.
24. Ahmad R, Changeez M, Khan JS, Qureshi U, Tariq M, Malik S, Ahmad SH, Shafique MS. Diagnostic accuracy of peritoneal fluid gene xpert in the diagnosis of intestinal tuberculosis, keeping histopathology as the gold standard. Cureus. 2018;10(10):e3451.
25. Phyu MH, Kyaw KWY, Myint Z, Thida A, Satyanarayana S, Aung ST. Sputum smear-positive, Xpert® MTB/RIF-negative results: magnitude and treatment outcomes of patients in Myanmar. Public Health Action. 2018;8(4):181-186.
26. Baraua, Hossana M. Adenosine deaminase in diagnosis of tuberculosis: A Review. Anwer Khan Modern Medical College Journal. 5(2):43–48.
27. Atta S, Kassem A, Elhadidi A, Esawy HE. The diagnostic value of adenosine deaminase activity in pulmonary tuberculosis: Comparison between sputum and serum. Egyptian Journal of Chest Diseases and Tuberculosis. 2015;64(1): 103-107.
28. Mohammed TJM, Wafaa H, Wafaa B. Adenosine Deaminase (ADA) in peritoneal tuberculosis. Available: https://www.worldgastroenterology.org/publications/e-wgn/e-wgn-expert-point-of-view-articles-collection/adenosine-deaminase-ada-in-peritoneal-tuberculosis, Accessed (25-09-2022)
29. Dale CL et al. Treatment of nontuberculous mycobacterial pulmonary disease: an official ATS/ERS/ESCMID/IDSA clinical practice guideline. Clinical Infectious Diseases, ciaa241; 2020.
30. CDC. Treatment of tuberculosis disease. Available:https://www.cdc.gov/tb/education/corecurr/pdf/chapter6.pdf, Accessed (25-09-2022)

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/92554