Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

Original Research Article

A Radilogical Study On Peritoneal Tuberculosis: Hospital Based Study In Lucknow And Prayagraj

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Abstract

Introduction: Peritoneal tuberculosis (PTB), although rarer than its pulmonary counterpart, is a serious health concern in regions of the world with high tuberculosis prevalence. Individuals with baseline immune compromise condition, whether acquired or medically induced, are at greatest risk for experiencing PTB. While medical treatment of the condition is similar to that of the pulmonary disease, the generally immune compromised state of those infected with PTB, along with a lack of highly sensitive and specific testing methods make early diagnosis difficult.

Material and Methods: This study done at Dept of Radio Diagnosis, Integral Institute of medical sciences and research, Lucknow,UP. also done at United Medicity Hospital and Medical College ,Prayagraj (Nov 2021 to June 2022)

Results: The contrast-enhanced CT scan of the abdomen showed changes in the density of the peritoneum with thickening, multiple small nodules in the upper third part of the abdomen enhanced by the contrast medium.

Conclusion: TB continues to be a highly prevalent disease. Furthermore, peritoneal TB is the most frequent type of gastrointestinal TB, and since it can occur with non-specific manifestations

Keywords: Peritoneum tuberculosis, contrast medium

Introduction

Tuberculosis is responsible for about 1.7 million deaths annually worldwide, and the number of new cases (more than 9 million) is the greatest in history(1). Tuberculosis is known to be associated with poverty, deprivation and immunodeficiency(2). Lungs are the primary involved organs and abdominal involvement occurs in about 11–12% of patients with extrapulmonary tuberculosis(3–5). In Brazil, according to recent data available at Datasus, the tuberculosis incidence rate, including all the disease presentations, in 2010, corresponded to 37.57:100,000 inhabitants, while the incidence rate for the extrapulmonary presentation of the disease was 5.28. In 2010, 71,658 new cases of tuberculosis were recorded in Brazil, as all the disease presentations are considered; and among those cases, 10,071 were extrapulmonary tuberculosis.Tuberculosis (TB) therapy and the generally improving socio-economic status worldwide have decreased the burden of TB. However, one-fourth of the

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

world's population continues to be infected with TB.[15] Regions of southeast Asia, the Western Pacific and sub-Saharan Africa remain particularly affected. While most cases of TB are pulmonary, the rate of abdominal cavity infection and its contents, identified as abdominal TB, appears to be rising and is currently the 6th most common extrapulmonary site for TB infection.[16] TB of the peritoneum (PTB) accounts for about 25–50% of abdominal TB cases and 0.1–0.7% of all TB cases.[17] The rising prevalence of abdominal TB, and along with it PTB, is thought to be secondary to the increasing prevalence of immunocompromised states, including human immunode ficiency virus (HIV) infection and alcoholic liver disease, as well as of increased migration into endemic regions.[18,19]

Results

This study done at Dept of Radio Diagnosis, Integral Institute of medical sciences and research, Lucknow,UP. also done at United Medicity Hospital and Medical College ,Prayagraj (Nov 2021 to June 2022).Physical examination on admission findings: normal vital signs, body mass index (BMI) of 22, abdominal distension with signs of moderate ascites and mild diffuse pain on palpation without signs of peritoneal irritation. Admission laboratory tests results: complete blood count: mild normocytic anemia (hemoglobin 11.4 g/dL), normal white blood cell and platelet counts, elevated C-reactive protein levels and elevated erythrocyte sedimentation rate (ESR). Hyponatremia (129 mmol/L) was also evidenced; kidney function was normal, urinalysis results were normal, and no abnormal findings were evidenced on a chest X-ray. A CT scan of the chest and a CT of the abdomen were performed to rule out the presence of neoplasms as a differential diagnosis. The contrast-enhanced CT scan of the abdomen showed changes in the density of the peritoneum with thickening, multiple small nodules in the upper third part of the abdomen enhanced by the contrast medium (Figure 1), a small size liver, and abundant ascites; the CT scan of the chest showed scarce bilateral pleural effusion. So a laparoscopy was performed to obtain samples from the peritoneum and the liver for biopsy purposes; besides, the following findings were reported during the procedure: extensive involvement of the entire peritoneum by yellowish micronodules, presence of some inter-ascitic adhesions, abundant greenish non-purulent fluid in the peritoneal cavity, as well as a cirrhotic liver with some micronodules. The histopathological study of the peritoneum sample was compatible with granulomatous inflammation, with negative Ziehl-Neelsen (ZN) staining (Figure 2), but with positive polymerase chain reaction (PCR) for *Mycobacterium tuberculosis*. The enzyme-linked immunosorbent assay (ELISA) was negative for HIV.

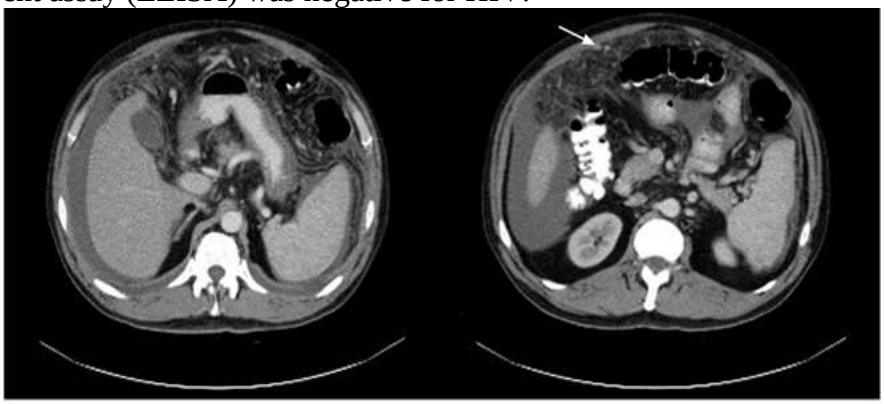

Figure 1 : Contrast-enhanced CT scan of the abdomen. Small size liver, thickening and multiple small nodules in the peritoneum enhanced by the contrast medium.

The patient was treated for 9 months with a monitored TB treatment regimen, achieving improvement of both clinical signs and laboratory tests values, as evidenced in outpatient follow-up visits; likewise, normalization of body weight and complete resolution of ascites

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

without loss of liver function were achieved after the first phase of treatment was completed. In addition, the patient keeps attending follow-up visits in the hepatology service due to the alcoholic cirrhosis (Child-Pugh score B) diagnosis.

Discussion

It is well known that the clinical presentation of abdominal TB is widely variable and, therefore, it can mimic other frequent and infrequent abdominal diseases. It was first described in 1843 and it can be caused by any of the members of the *Mycobacterium Tuberculosis* complex (M. *tuberculosis, M. africanum, M. bovis, M. caprae, M. microti*, among others) known as acid-fast bacilli and is characterized by its paucibacillary nature[6,7]. It is the sixth most frequent cause of extrapulmonary TB, and peritoneal TB accounts for up to 50% of such cases[10]. Some associations or possible risk factors for the development of peritoneal TB include HIV infection, peritoneal dialysis, type 2 diabetes, the use of immunosuppressive drugs such as corticosteroids and anti-tumor necrosis factor alpha (anti-TNF-α) agents, and alcoholic cirrhosis, as it happened in the case presented here[10]. The peritoneum can be infected by the bacillus through the following mechanisms: hematogenous or lymphatic route from a pulmonary focus; ingestion of infected material that reaches mesenteric and retroperitoneal lymph nodes that can rupture and disseminate the mycobacterium; direct extension from neighboring organs or direct contamination of the peritoneum in patients with chronic kidney disease (CKD) on peritoneal dialysis[6,11]. In our case, in a subsequent evaluation, the patient reported having ingested unpasteurized milk, which could be suggested as a possible pathophysiological mechanism of the infection. Clinical findings of peritoneal TB include the presence of ascites, abdominal pain, fever, weight loss, hyporexia and abdominal distension. Given the non-specific nature of its clinical manifestations, together with the subacute nature of the disease, a late diagnosis is made in up to 70% of cases, so a low threshold of clinical suspicion must be always considered[5]. In case of ascites, observing its characteristics such as a yellow-black or even hematic color is fundamental[6]; usually, protein concentration is > 30 g/L and cellularity, > 400 cells/mL, of lymphocytic predominance, which constitutes an exudate with SAAG < 1.1 g/dL. However, in patients with peritoneal TB and concomitant cirrhosis, as it happened in the case described here, this index loses sensitivity with values ranging from 29% to 88%; these patients, as well as those on peritoneal dialysis, may present cellularity with neutrophilic predominance, so the possible confusion with spontaneous bacterial peritonitis must be considered[6,10]. Cytological analysis of peritoneal fluid is necessary in the differential diagnosis of neoplasm. Measurement of lactate dehydrogenase (LDH) in blood or fluid is less sensitive and specific, and is not routinely used. In addition, despite Ca^{125} antigen is elevated in these cases, this test is not recommended either as a routine diagnostic study[5,6]. Imaging studies such as ultrasound and CT scan are fundamental for reaching a diagnosis, the latter being the most sensitive method for assessing the peritoneum[6]. Regarding the measurement of ADA levels with a cut-off point > 30 IU/mL and 36 IU/mLfor others, it can have a high sensitivity and specificity (96% and 98%, respectively) in the absence of immunosuppression or cirrhosis[1], so that it is a very useful tool, especially in endemic areas with low possibility of taking samples for performing biopsies[6,13]. ZN staining is positive in only 3% of cases and culture is still the gold standard, for which solid and liquid medium techniques are generally available, including the BD BACTEC automated blood culture method, which reduces the processing time by half[6,14] In a systematic review, Sanai and Bzeizi reported positivity in 35% of cases[7]. As for immunological tests, tuberculin is not specific for active TB and it has a low sensitivity. Other tests such as interferon gamma (IFN-γ) measurement and specific immunoglobulin G (IgG) against mycobacteria are useful in ascites cases, but their availability is very limited due to their cost. Molecular tests such as PCR and ligase chain

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

reaction (LCR) offer fast results, but their cost is high and sometimes their sensitivity is low (60-80%); in fact, LCR has a better performance, but is less available[1]. In the case presented here, PCR test allowed confirming the diagnosis, which had been highly suspected based on clinical and imaging and laboratory findings. Finally, peritoneal biopsy by means of laparoscopy is fundamental for histological confirmation and in the differential diagnosis of neoplasm; currently, percutaneous approaches are also being performed in non-fibroadhesive peritoneal TB cases[6,7]. Peritoneal TB should be treated with the same treatment regime used for pulmonary TB, being 6 months the usual duration. However, some authors suggest extending treatment time to 9 or 12 months, especially in patients with HIV and who are not receiving antiretroviral therapy[6,10]Our patient received supervised treatment for 9 months, achieving improvement of both clinical signs and laboratory values at the end of the first phase of treatment.

Conclusion

TB continues to be a highly prevalent disease. Furthermore, peritoneal TB is the most frequent type of gastrointestinal TB, and since it can occur with non-specific manifestations, a low threshold of clinical suspicion must be always maintained, even in patients who are not immunocompromised.

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ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

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