Case Report

Raised CA125 serum level in tubercular peritonitis

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Abstract

A 24-year old woman was admitted with a history of fever and pelvic pain. ESR and CA125 serum level were high and PPD test was negative. Ultra sound and CT evaluation detected free fluid in abdominopelvic cavity. Laparotomy showed fibrinous strands adhering to and fibrotic sac surrounding the components of abdominal cavity. Opening the sac, grey miliary nodules were spotted and pathologic examination revealed multiple granulomatous lesions. Diagnosed with TBP, patient underwent specific antibiotic therapy and her condition improved significantly following treatment. As laboratory findings and image analysis may be misleading in diagnosis of TBP, diagnostic approach of laparotomy and subsequent pathologic examination is of vital value — particularly in premenopausal female patients to preserve fertility.

Keywords: Tuberculosis, Tubercular peritonitis, CA125, Laparotomy.

Introduction

Tuberculosis (TB) is a well studied fatal infectious disease, responsible for about 3 million deaths worldwide per year.[1] Typically the infection has pulmonary involvement; however in one third of the cases other body organs may be involved. Almost all tuberculosis patients with an infection responding to medical treatment, heal, whilst there are cases resistant to therapies and the fatality rate in this group is above 50% within 5 years post infection.[2]

Nowadays pulmonary tuberculosis has quite a low prevalence; however no decline in the prevalence of extra-pulmonary tuberculosis has been reported. It is estimated that 20-37% of extra-pulmonary tuberculosis infections are genito-urinary tuberculosis. The prevalence of genito-urinary tuberculosis in women is higher than men. In women, this complication involves endometrium and fallopian tube with the symptoms of pelvic pain, menstrual disturbance and infertility. The diagnosis is based on cell culturing and examination of the curetted compounds of the uterus.[2]

Tubercular Peritonitis (TBP) — another type of extra-pulmonary tubercular infection — is caused by direct infiltration of mycobacterium tuberculosis from ruptured peritoneal lymph nodes, other peritoneal organs, or blood infection. TBP is reported to be relatively uncommon in developed countries, whilst existing in under-developed and developing countries; however its prevalence is now rising in developed countries primarily due to international travels, immigration from under-developed countries, socio-economic deprivation, and immune suppressive cases due to HIV infection and subsequent tuberculosis contraction.

The symptoms of this disease may show great variability and mimic peritoneal carcinomatosis. Misdiagnosis and negligence of treatment of tuberculosis could be fatal. Therefore still invasive diagnostic approaches are necessary to make an accurate diagnosis.

The following is the case of an immune-competent patient with TBP with delayed diagnosis despite extensive laboratory investigations.

Case Presentation

A 24-year-old female patient with Afghan nationality, without a remarkable past medical history and taking no contraceptive measures, was admitted with 2-week history of continuous fever and pelvic pain and suffering from a treatment resistant vaginal exudation for 3 weeks. Clinical examination did not show any sign of abnormal uterine bleeding, while lower abdominal point tenderness, cervical motion tenderness and adnexal tenderness — particularly in lower right quadrant — were observed. In laboratory examination, blood haemoglobin content (12 g/dl), white blood cell (WBC) count (4,500 cells per microliter) and platelet count (350,000 cells per microliter) were all in normal range. The result of purified protein derivative (PPD) test was negative; erythrocyte sedimentation rate (ESR) was very high (112 mm/hr), cancer marker 125 (CA125) level was 797 U/ml (range: 0-35 U/ml). Ultra sound evaluation revealed uterine and ovaries in normal shape, an unidentified mass of 5x6 cm diameters in right adnexa, and a negligible amount of free fluid in pelvic area. A computed tomography (CT) scanning only showed free fluid in interloop and pelvic areas and bilateral pleural effusion. She was admitted as a suspicious case of pelvic inflammatory disease and underwent antibiotic therapy.

As patient remained symptomatic despite receiving a wide range of antibiotics and prolonged course of therapy, culdocentesis was performed and 10ml serosanguinous fluid

and 20ml pus were aspirated. The results of laboratory analysis of aspirated material were 8 g/dl protein concentration, 28 mg/dl glucose, WBC count of 40,000 cells / microliter (polymorphonuclear cells 90%, lymphocytes 10%) and red blood cell count of 1500 cells / microliter. Adenosine deaminase (ADA) level was 27 U/l. In cytological examination no malignant cell was detected. Laboratory examination via cell culturing, smear test and Ziehl-Neelsen staining identified no mycobacterium or other microorganisms.

In laparatomy with midline incision, the following abnormalities were observed: 100ml of a translucent fluid with yellowish colour within pelvic and abdominal cavities; "violin string" fibrinous strands extending from the surface of the liver to pelvis and abdominal wall; omentum - abnormally thick in upper abdomen - attached to anterior abdominal wall; and bowels, uterus and ovaries surrounded by a fibrotic sac. Gently opening the fibrotic sac, grey miliary nodules were spotted all over the surfaces of the peritoneum, omentum, uterine serous, cul-de-sac, exterior of the intestine and liver. A septic fluid was detected in right adnexa and was drained out. Pathologic assessment of the collected fluid and fibrotic tissue revealed multiple sites of caseation, multinuclear giant cells and caseus multiple chronic granuloma.

Diagnosed with TBP, patient underwent therapy with rifampicin, isoniazid, ethambutol, and pyrazinamide. Following this treatment, the patient's condition improved significantly within the following weeks.

Discussion

TBP is a benign condition, causing ascites and abdominal cramps. It is generally seen in three forms: wet ascitic, fibrotic fixed and dry plastic.[3,4] Clinical manifestations of wet TBP are appearance of numerous small peritoneal nodules over serous layer accompanied with tuberculous ascites. In dry plastic type, internal organs of the abdominal cavity severely adhere to each other and show stickiness. Appearance of pelvic abscesses is another common feature of this complication.[5] A patient with etiologically non-specified abdominal pain, fever and ascites, could be a legitimate candidate for TBP. In TBP, the peritoneal paracentesis shows elevated levels of protein and lymphocytic leukocytosis; although in some cases a neutrophil dominancy may be observed. The chance of a proper diagnosis of TBP based on direct smearing or cell culture examination is slim. PPD test has a low sensitivity; it was positive in only 27% to 42% of patients with proven peritoneal TB.[6] Furthermore, Ultra sound and CT scanning do not allow a definite diagnosis due to imaging limitation. Although evaluating CT scan results are of diagnostic value in TBP, due to overlapping of these findings with a wide variety of disease processes, in most cases making a final decision and precise diagnosis solely based on imaging results, is difficult and the clinician needs to take other parameters into consideration.[7]

Culturing cells obtained from high volumes of ascitic fluid may produce better results and improve diagnosis; although in most cases a peritoneal biopsy is finally required to confirm the diagnosis.[2]

There have been some previous reports of raised CA125 in TBP. Uzunkoy and colleagues reported of elevated levels of CA125 in four abdominal TB patients.[8] Thakur et al. reported of another case of a 48-year old female diagnosed with TBP with over-expression of CA125 marker. The case was cured following anti-tubercular treatment and the tumour marker level returned to normal level.[9] In another case, a patient finally diagnosed with peritoneal tuberculosis showed elevated serum CA125 level mimicking advanced stage of ovarian cancer. Following anti-tubercular treatment the symptoms resolved and CA125 level reduced to normal.[10]

There are some possible explanations for raised CA125 levels in TBP. Activation of inflammatory cascades in the presence of TB pathogen — mycobacterium tuberculosis — may cause an abnormal mesothelial cellular proliferation, resulting in elevation of CA125 tumour marker. Another explanation for this correlation is the similarity of certain surface antigens of mycobacterial cell membrane with epitopes of CA125 tumour marker, although this hypothesis needs to be examined by molecular methods.

In premenopausal tuberculosis patients, CA125 surging is of little diagnostic value. As in this stage of life, both gynaecologic and non-gynaecologic benign tumours may stimulate CA125 expression, and this elevation could be considered a false positive signal. Therefore interpretation of the results of CA125 expression has to be done cautiously and within the context of other pathologic manifestations.

Conclusion

As laboratory findings and image analysis may be misleading in diagnosis of TBP, the conclusion drawn from the described case is that invasive diagnostic approach of laparotomy and subsequent pathologic examinations can guarantee an early diagnosis and prompt treatment. This is particularly of vital value in premenopausal female patients to preserve functionality of the reproductive system and prevent infertility.

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