Unusual association of diseases/symptoms

A patient with tuberculous peritonitis with very high serum CA 125

Bong Soo Seo,¹ In Kyeom Hwang,¹ Ji Eun Ra,¹ Yong Sung Kim²¹Department of Internal Medicine, Sanbon Hospital, Wonkwang University, Gunpo, Republic of Korea²Department of Internal Medicine, Digestive Disease Research Institute, Sanbon Hospital, Wonkwang University, School of Medicine, Gunpo, Republic of Korea

Correspondence to Professor Yong Sung Kim, wms89@hanmail.net

Summary

An 88-year-old woman presented with abdominal pain and distension. Serum cancer antigen 125 (CA 125) level was very high; however, abdominal CT reveals ascites without definite mass. Ascites analysis revealed a lymphocytic exudate with high adenosine deaminase enzyme level, negative stains for bacteria and negative PCR for *Mycobacterium tuberculosis*. Presumptive diagnosis for tuberculous peritonitis was made and antituberculous therapy resulted in the resolution of ascites and normalisation of CA 125.

BACKGROUND

Cancer antigen 125 (CA 125) is a tumour-associated protein and is elevated in malignant conditions, such as ovarian cancer. However, CA 125 also increased in benign condition such as intraperitoneal inflammation. Patients with tuberculous (TB) peritonitis could be presented with ascites and increased CA 125; therefore, it may easily be misdiagnosed as peritoneal carcinomatosis. Physicians should be careful when they interpret elevated CA 125 in patients with ascites to avoid unnecessary investigation and surgery.

CASE PRESENTATION

An 88-year-old woman visited outpatient department for prickling abdominal pain of 10 days. She was a smoker for 40 years and had taken medication for Alzheimer's dementia and depression. She looked acutely ill, but vital sign was stable. Blood pressure was 130/70 mm Hg, pulse rate of 80/min, temperature of 36.5°C and respiratory rate of 20/min. Physical examination showed a slightly distended abdomen and diffuse abdominal direct tenderness without rebound tenderness.

INVESTIGATIONS

Laboratory investigations revealed mild hypoalbuminaemia (3.576 g/dl) and elevated hs-CRP (1.63 mg/dl). Complete blood count was within reference levels. CA 125 level was 11720.0 U/ml (normal range 0–35 U/ml). Carcinoembryonic antigen and α -fetoprotein were within reference levels. Chest x-ray revealed no abnormal findings. Abdominal ultrasonography revealed large amount of ascites; however, there was no definite mass on subsequent abdominopelvic CT. Paracentesis revealed amber colour ascitic fluid with increased white blood cells (7975/mm³, 66% lymphocytes) and serum-ascites albumin gradient was 0.98 g/dl. On gynaecological consultation, the gynaecologist concluded that she had a high possibility of ovarian cancer based on CA 125 level without further pelvic ultrasound

examination and recommended diagnostic laparoscopy. But the patient and her family members refused invasive diagnostic procedure.

However, subsequent cytology report of ascites revealed no malignant cells and the level of ascitic adenosine deaminase was high as 49.9 IU/l. Although PCR for *Mycobacterium tuberculosis* in ascites was negative and CA 125 level was very high, we made presumptive diagnosis of TB peritonitis and assumed that high CA 125 level was caused by intraperitoneal inflammation rather than malignancy because Korea is still an endemic area of tuberculosis.

DIFFERENTIAL DIAGNOSIS

TB peritonitis

Peritoneal carcinomatosis possibly due to ovarian cancer.

TREATMENT

After presumptive diagnosis of probable TB peritonitis was made, treatment with anti-TB medication including isoniazid, rifampicin, ethambutol and pyrazinamide according to her body weight was started.

OUTCOME AND FOLLOW-UP

Her abdominal pain was gradually improved after taking anti-TB medication. After 2 months of anti-TB medication, follow-up CT scan showed a greatly reduced ascites compared to initial CT and CA 125 level decreased to 43.9 U/ml. After 6 months of anti-TB therapy, she has no recurrence of ascites with normal CA 125 level and now she is doing well without any symptoms (figure 1).

DISCUSSION

Tumour markers have been used for cancer screening, diagnosis, follow-up after specific treatment and detection of recurrence; however, it should be interpreted carefully because they also increase in the benign condition. CA 125 is a tumour-associated protein normally expressed in

Figure 1 Abdominopelvic CT findings. (A,B) Considerable amount of ascites was noted in the abdominal cavity. (C,D) After 2 months of antituberculous therapy, follow-up CT showed a greatly reduced ascites compared to initial CT.

coelomic epithelium during fetal development. CA 125 is currently used for monitoring response to treatment and recurrence of epithelial ovarian cancer.¹ It is also used to aid in differential diagnosis of adnexal masses whether it is benign or malignant.²

The role of serum CA 125 measurement in screening for ovarian cancer is not yet established. CA 125 antigen is found on both healthy and malignant mesothelial (pleural, pericardial, peritoneal, endometrial) and non-mesothelial cells (amniotic membrane, tracheobronchial and cervical epithelium).³ Thus CA 125 is elevated not only in ovarian cancer and other malignant conditions such as some lymphoma, but also in benign conditions such as pelvic inflammatory disease, endometriosis, peritonitis, pregnancy, menstruation and even in congestive heart failure.³ In addition, it is elevated only in 50% of those with stage I ovarian cancer.¹ Therefore, CA 125 has the limit of usefulness in screening of ovarian cancer. Recent large randomised trial revealed that screening with CA 125 in the general population did not reduce ovarian cancer mortality compared with usual care.⁴ But CA 125 is known to be raised before clinical diagnosis of ovarian cancer in significant number of patients.⁵ Sensitivity may be improved by estimating the risk from the temporal pattern of CA 125 and by combination use of other tumour markers in addition to CA 125 such as Ca 15-3, CA 19-9 and OVX 1.^{5,6}

Especially in some endemic area, TB peritonitis is one of the benign causes for increased CA 125. In a comparative study of 20 female patients with TB peritonitis and 17 female patients with peritoneal carcinomatosis, CA 125 levels were 448 U/ml (range 32–1725 U/ml) and 1848 U/ml (range 42–14,380 U/ml), respectively.⁷ Although the age was older (mean 63 vs 39 years) and CA 125 is higher in the peritoneal carcinomatosis group compared to the TB peritonitis group, it should be noted that CA 125 could be increased about 10-fold of normal value in patients with TB peritonitis. Thus CA 125 could be used for monitoring treatment response of TB peritonitis.

Abdominal pain is another clue for suggestion of TB peritonitis rather than carcinomatosis in this case. Patients with TB peritonitis show fever, night sweats and abdominal pain more frequently compared to those patients with ovarian cancer with ascites.⁸

As in this case of postmenopausal women with ascites, raised CA 125 is frequently perceived as ovarian cancer without radiological or histological proof and this is a misconception.³ We measured CA 125 before CT examination in this case and it made us more confused to diagnose the cause of ascites. To avoid diagnostic confusion, CA 125 should be measured after pelvic ultrasound examination or CT in patients with ascites.⁸ A misinterpreted raised CA 125 can lead to many unnecessary investigations or radical surgeries.^{3,9}

Therefore, physicians have to consider age, clinical symptoms and country of origin when they encounter patients with ascites with high CA 125 level.

We report a case of TB peritonitis that showed very high serum CA 125 level and was confirmed by response to anti-TB therapy.

Learning points

- ▶ Tuberculous (TB) peritonitis is one of the causes of increased cancer antigen 125 (CA 125) in endemic area.
- ▶ To avoid diagnostic confusion, CA 125 should be measured after pelvic ultrasound examination or CT in female patients with ascites.
- ▶ Abdominal pain, lymphocyte predominant exudative ascites and high adenosine deaminase level with negative cytology in ascites suggest TB peritonitis.
- ▶ The response to anti-TB therapy confirms the diagnosis of TB peritonitis.
- ▶ It is prudent to consider age and country of origin for differential diagnosis of patients with ascites and high serum CA 125 level.

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Competing interests None.

Patient consent Obtained.

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