

TUBERCULOUS PERICARDITIS MIMICKING BACTERIAL PERICARDITIS IN PERICARDIAL EFFUSION

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ABSTRACT

Tuberculosis (TB) is one of the infectious diseases with the highest prevalence which causes high mortality worldwide. Although rarely found, TB pericarditis can be life threatening because it can cause pericardial effusion which, if left untreated, can cause death due to cardiac tamponade. A 44 years old man presented with cardiac tamponade with clinical appearance of Tb, but pericardial fluid analysis favored bacterial pericarditis. Pericardial fluid analysis showed fluid glucose was 4, fluid protein was 5.320, LDH was 3.781, yellow, cloudy, cell count: 1.716, polymorphonuclear (PMN) 85,2, mononuclear (MN) 14,8. Patient then diagnosed with severe pericardial effusion with sign of tamponade due to bacterial pericarditis with differential diagnosis was tuberculous pericarditis. On the 4th day of treatment, it was found out from the results of GenXpert that there was Mycobacterium tuberculosis in the pericardial fluid with increased Adenosine deaminase (ADA) level, and Chest X-ray showed milliary TB. The patient was then given category 1 anti-tuberculosis drug and methylprednisolone 40 mg. The diagnosis of TB pericarditis is challenging, it requires knowledge about its pathogenesis and thorough analysis in its diagnosis. Not only depending on one tool, but still clinical assessment and confirmation with definite diagnostic tools such as culture or histopathology.

Keywords: bacterial pericarditis, diagnosis, pericardial fluid, PMN, tuberculous pericarditis

ABSTRAK

Tuberkulosis (TB) adalah salah satu penyakit infeksi dengan prevalensi terbanyak yang menyebabkan kematian di seluruh dunia. Meskipun jarang dijumpai, TB perikarditis dapat mengancam jiwa karena bila tidak diterapi dapat menyebabkan kematian akibat tamponade jantung. Seorang laki-laki, usia 44 tahun, datang dengan tamponade jantung dan tampakan klinis TB, namun hasil analisis cairan perikardium lebih mendukung ke diagnosis perikarditis bakterialis. Analisis cairan perikard menunjukkan glukosa cairan: 4, protein cairan 5320, LDH 3781, warna kuning, keruh, jumlah sel: 1716, PMN 85.2 dan MN 14.8. Pasien didiagnosis dengan efusi perikardium berat dengan tanda tamponade et causa perikarditis bakterialis dengan diagnosis banding TB perikarditis. Pada hari ke-4 perawatan, dari hasil GenXpert ditemukan Mycobacterium tuberculosis dari cairan perikard dan peningkatan kadar ADA, dan dari hasil rontgen ulang menunjukkan gambaran TB milier. Pasien kemudian diberikan obat anti tuberkulosis kategori 1 dan metilprednisolon 40

mg. Diagnosis pericarditis TB sangat menantang, karena memerlukan pengetahuan mengenai patogenesisnya dan analisis yang lengkap untuk diagnosis. Tidak hanya bergantung pada satu alat, namun tetap melihat klinis dan dikonfirmasi dengan alat diagnostic definitif seperti kultur dan histopatologi

Kata kunci: perikarditis bakterialis, diagnosis, cairan perikardium, perikarditis tuberkulosis

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INTRODUCTION

Tuberculosis (TB) is one of the infectious diseases with the highest prevalence which causes high mortality worldwide. Tuberculosis is caused by the bacil *Mycobacterium tuberculosis*. Tuberculosis is a major global problem, as it is estimated that TB infects 1/3 of the world's population with an incidence of 1% of the population per year.¹

Pericarditis TB is one of extrapulmonary TB which has an incidence of 20% of all TB infection, and increases to 50% in HIV patients, especially in Africa. Although rarely found, TB pericarditis can be life threatening with a mortality of up to 85% within 6 months, because it can cause pericardial effusion which, if left untreated, can cause death due to cardiac tamponade.² We report a case of tuberculous pericarditis that mimicked bacterial pericarditis at the start of the examination.

CASE ILLUSTRATION

A 44 years old man came with complaints of shortness of breath since 2 weeks before admission, accompanied by a cough with no phlegm since 3 months before. Complaints were not accompanied by fever. Patient experienced night sweats and weight loss. There was no history of contact with TB patients or previous TB treatment.

On admission he was hypotensive, tachypnea, and tachycardia with blood pressure of 80/50 mmHg, pulse rate 108 beat per minute, respiratory rate 24 times per minute, afebrile, and peripheral oxygen saturation 93% on room air. The patient was in the underweight category (BMI 17,58 kg/m²). There was pulsus paradoxus. From physical examination, there were oral thrush, increased JVP, cardiomegaly with ictus cordis palpable at ICS VII 2 cm lateral to the left midclavicular, with muffled heart sound. No additional breath sounds were found.

Laboratory tests results at RSHS with hemoglobin was 12,2 gr/dL, leukocytes 8090, platelets

268.000, differential count 0/0/1/88/8/3. C-reactive protein 3,18 mg/L. Electrocardiography showed sinus tachycardia, low voltage, with no electrical alternans (Figure 1). Chest X-ray showed cardiomegaly with suspected pericardial effusion (Figure 2). Patient underwent bedside echocardiography with severe circumferential pericardial effusion (3.2 – 5.7 cm), RA systolic collapse (+), RV diastolic collapse (+), swinging heart (+).



Figure 1. ECG result



Figure 2. Chest X-ray

Pericardiocentesis was carried out, 1050 ml of pericardial fluid was removed. Echocardiographic evaluation shows pericardial effusion improved by 3,0-5,0 cm circumferential; RA systolic collapse (-), RV diastolic collapse (-), swinging heart (-). Pericardial fluid analysis showed fluid glucos: 4, fluid protein: 5.320, LDH: 3.781, color: yellow, clarity: cloudy, cell count: 1.716, PMN 85,2, MN 14,8. Patient then diagnosed

with severe pericardial effusion with sign of tamponade due to bacterial perikarditis with differential diagnosis was tuberculous perikarditis, accompanie with oral candidiasis. Patient was then given 2x1 gr iv ceftriaxone, 3x600 mg ibuprofen and 1x0,5 mg colchicine. On the 4th day of treatment, it was found out from the results of GenXpert that there was *Mycobacterium tuberculosis* in the pericardial fluid. Adenosine deaminase (ADA) examination was also carried out with a results of 96,08 u/L (normal 0-35 u/L). Chest x-ray was repeated on the fourth day with the impression of milliary Tb (Figure 3). The patient was then given category 1 anti-tuberculosis drug and methylprednisolone 40 mg.



Figure 3. Second x-ray (4th day of treatment)

On the seventh day of treatment he experienced increased shortness of breath accompanied by fever, a chest x-ray was again performed with the impression of pneumonia (Figure 4) and a diagnosis of Hospital acquired pneumonia was made. The patient then went into septic shock and died on the 13th day of treatment.



Figure 4. Third x-ray (At 7th day of treatment)

What makes this case interesting is the pericarditis TB which resembles bacterial pericarditis from the results of the initial analysis of the pericardial fluid.

DISCUSSION

Pericardial effusion has various etiologies. Epidemiologically, there are differences in prevalence between developed and developing countries. In developed countries, about 50% of the causes are still idiopathic, 10-25% cancer, 15-30% pericarditis and infection, 15-20% iatrogenic, and 5-15% connective tissue disease. Meanwhile, in developing countries, where tuberculosis is endemic, the incidence of pericardial effusion due to Tb is still > 60%.²

An accurate diagnosis of TB pericarditis is important because without specific therapy, the mean survival rate is 3,7 months with a mortality of up to 85% within 6 months.³ Symptoms of TB pericarditis are often non-specific such as shortness of breath, cough, pleuritic chest pain, fever, weight loss and night sweats. Cardiac tamponade occurs in about 10% of TB pericarditis cases.⁴ Physical examination of tamponade can reveal Beck's triad, namely hypotension, increased jugular venous pressure, and weakened heart sounds.²

The pathogenesis of TB pericarditis is known to be divided into 4 stages⁵; Fibrinous exudate with PMN leukocytosis at first, abundant mycobacterium and early formation of granulomas; Serosanguin effusion with predominant macrophages and T cells; Absorption of an effusion with the formation of granulomatous tissue and pericardial thickening; Constrictive scars, visceral fibrosis and parietal pericardium may calcify.

From this pathogenesis, it can be seen that in the early stages of TB pericarditis, there will be a lot of PMN in the pericardial fluid. Therefore, in this patient, it is estimated that the pericardial effusion that occurs is still an early stage so that there was not many lymphocytes. Reuter et al. in their research stated that there are several diagnostic tools to establish TB pericarditis. One that is often used is the lymphocyte / neutrophil value ≥ 1 in pericardial fluid with a sensitivity value of 73%, a specificity of 79% and a PPV of 86%. Whereas the ADA test ≥ 40 u/L in pericardial fluid has a sensitivity of 87%, a specificity of 89% with a PPV of 95%.³ The use of the GeneXpert test on pericardial fluid is still limited, but there is a study demonstrating this test has a sensitivity of 52% and specificity of 100%. The role of GeneXpert can be used as an additional diagnostic aid in the diagnosis of TB pericarditis, but it cannot replace culture or histopathology in defining the diagnosis of TB pericarditis. Examination of AFB on pericardial fluid even though it has good specificity, can only be found in 40-60% of cases.⁶ From some of these diagnostic tools, we can conclude that the use of pericardial fluid lymphocyte/neutrophil ratio analysis cannot be used as our benchmark in diagnosing TB pericarditis and a further examination must be carried out to confirm the diagnosis. Clinical reference can also be taken into consideration in the context of diagnosis, where systemic symptoms that support pulmonary TB or TB are found, will confirm the diagnosis of TB pericarditis.

Bacterial pericarditis is associated with about 40% of infection in the lungs. The main etiologies

are *Staphylococcus aureus* and *Streptococcus pneumoniae*, with gram-positive infections causing 40-45% of all infections. The incidence of cardiac tamponade accounts for 42-77% of all bacterial pericarditis. In bacterial pericarditis, exudate will be found in the pericardial fluid, namely specific gravity >1.015 , protein $>3,0$ g/dL (fluid/serum ratio $>0,5$), lactate dehydrogenase (LDH) >200 mg/dL (serum / liquid $>0,6$), and low glucose concentration. Leukocytes will also increase in bacterial pericarditis with a more dominant proportion of neutrophils.⁷ In this case, it can be seen that at the beginning of the pericardial fluid analysis, there was an increase in leukocytes with dominant PMN and lymphocytes / neutrophils <1 . Therefore, at the beginning of the diagnosis, the patient was treated as bacterial pericarditis and was given antibiotics and NSAIDs.

CONCLUSION

The diagnosis of TB pericarditis is challenging, it requires a thorough analysis in its diagnosis. Not only depending on one tool, but still clinical assessment and confirmation with definite diagnostic tools such as culture or histopathology. The finding of dominant PMN in pericardial fluid indicates that the pericardial effusion that occurs is still in the early stages so that there are not many lymphocytes.

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