CASE REPORT

Coexistence of pulmonary tuberculosis and sarcoidosis: a diagnostic dilemma

Sanjay Kumar Mandal, Sudip Ghosh, Soumya Sarathi Mondal, Sumanta Chatterjee

Department of Internal Medicine, Medical College, Kolkata, West Bengal, India

Correspondence to
Dr Sanjay Kumar Mandal,
sanjaypgcal@yahoo.co.in

Accepted 28 November 2014

SUMMARY

Tuberculosis and sarcoidosis are multisystem diseases having different aetiology and management; however, they have similar clinical and histological characteristics. Very rarely they may coexist. We report a rare case of a 38-year-old woman who presented with chronic cough, low-grade fever and respiratory distress that was initially diagnosed as miliary tuberculosis. Diagnosis was supported by positive mycobacterial culture and initially responded to antitubercular treatment, but later recurrences led to further investigations and the diagnosis of coexisting sarcoidosis.

BACKGROUND

Tuberculosis (TB) and sarcoidosis are chronic granulomatous conditions involving the lungs as well as other multiple organs. TB is an infective disease caused by *Mycobacterium tuberculosis* (MTB) and characterised histologically by granulomas with caseous necrosis. Sarcoidosis is an immunological disorder of unknown aetiology characterised by the presence of non-caseating granulomas.¹ Although the aetiology of sarcoidosis is sometimes thought to be related to immune response to various mycobacterial proteins,^{2 3} rarely these diseases coexist. Diagnostically, the situation is challenging, as therapy for both these conditions differs widely. TB is primarily treated with antitubercular drugs (ATD) with addition of steroids only on specific indications; while sarcoidosis is managed mainly with steroids and other immunosuppressive agents.⁴ We report a rare case of coexistence of miliary TB with sarcoidosis in a patient. The case was unique since both the disease entities affected the lungs and created a diagnostic challenge, but finally the patient recovered well on dual therapy.

CASE PRESENTATION

A 38-year-old woman, a homemaker, presented with a history of low-grade evening rise of temperature and dry cough for 1 month and mild shortness of breath for the past 3 days. Her respiratory distress was insidious in onset, gradually progressive and not associated with chest pain, wheeze, palpitation or pedal oedema. Her dyspnoea had no diurnal variation and was not related to any change of posture. There was no history suggestive of haemoptysis, paroxysmal nocturnal dyspnoea or seasonal allergy. She had no history of rash, oral ulcer, photosensitivity, arthralgia, Raynaud's phenomenon, night sweats, abdominal pain, diarrhoea, dysuria, headache, nasal or aural discharge. She had a laparoscopic cholecystectomy 1 year earlier due to chronic calculous

cholecystitis. An enlarged cystic lymph node was found intraoperatively and sent for histopathology, which revealed multiple granulomas characteristic of TB. She then received ATDs for 6 months. She was married without any history of promiscuous sexual activity, menstrual irregularity or addiction. She had one healthy child through uncomplicated vaginal delivery and raised a few domesticated pigeons at home.

At admission the patient was normotensive with tachycardia and tachypnoea; she had an average build and was on a normal diet. She had moderate pallor but no icterus, clubbing, cyanosis, oedema or peripheral lymphadenopathy. She had bilateral vesicular breath sound with coarse inspiratory crepitations bilaterally in the infrascapular and interscapular areas. All other systemic examinations were normal.

INVESTIGATIONS

On admission, routine investigations revealed haemoglobin 10 g/dL, total count 10 600 with 72% neutrophils, 18% lymphocytes, 2% eosinophils, 8% monocytes and platelet count of 190 000; the erythrocyte sedimentation rate was 62 mm/h. She had normal urea and creatinine. Liver function test revealed total bilirubin 0.9 mg/dL, alanine transaminase 127 IU/L and aspartate transaminase 322 IU/L, alkaline phosphatase 620 IU/L, total protein 7.2 g/dL, albumin 3.2 g/dL and globulin 4 g/dL. Chest X-ray (figure 1) revealed bilateral coarse lung markings with miliary mottling. Sputum was negative for acid-fast bacilli. Ultrasonography of the abdomen showed mild

Figure 1 Chest X-ray posteroanterior view at presentation, showing bilateral coarse lung markings with miliary mottling.

CrossMark

To cite: Mandal SK, Ghosh S, Mondal SS, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-206016

hepatomegaly. High-resolution CT (HRCT) of the chest (figure 2) revealed bilateral interstitial thickening.

DIFFERENTIAL DIAGNOSIS

Our primary suspicion was miliary TB but we were also considering disseminated fungal infections such as histoplasmosis, sarcoidosis and pneumoconiosis as well as other causes of interstitial lung diseases as major differentials.

TREATMENT

During admission, the respiratory distress of the patient increased and she developed cyanosis. Blood and sputum for bacterial and fungal culture as well as rapid culture for MTB were sent and after a pulmonologist consultation the patient was started on ATD, considering miliary TB. Within a week of starting ATD, the patient clinically improved with diminished respiratory distress and reduced chest crepitations. A repeat chest X-ray taken after 2 weeks of ATD showed decreased miliary mottling. In the meantime, blood culture and sputum for bacterial, fungal and MTB came negative.

One week later, the condition of the patient suddenly deteriorated with increased respiratory distress. With the pulmonologist's consultation a repeat HRCT of the chest, fiberoptic bronchoscopy with bronchoalveolar (BAL) fluid analysis and bone marrow biopsy were planned for suspicion of disseminated TB. After 3 weeks, repeat HRCT (figure 3) showed partial regression of interstitial thickening and fine nodular lesions when compared with the earlier study. Bone marrow trephine biopsy (figure 4) showed hypercellular marrow, a few epithelioid cell granulomas, mild caseous necrosis and occasional Langan's giant cells, consistent with TB. Rapid culture for MTB from bone marrow sample was, however, negative. BAL fluid analysis revealed 80% mononuclear cells and 20% neutrophils, and culture showed positive growth of MTB. Transbronchial lung biopsy (figure 5) showed ill-defined epithelioid granulomas without caseation. The patient gradually responded to conservative treatment and was subsequently discharged with a diagnosis of miliary TB and advised to continue ATD.

OUTCOME AND FOLLOW-UP

Two weeks later, on follow-up, the patient was found to have recurrence of symptoms, though she was taking the medicines regularly. She was readmitted and repeat chest X-ray (figure 6) showed a bilateral diffuse reticulonodular pattern. Serum ACE

Figure 2 High-resolution CT of the chest at presentation, showing bilateral diffuse interstitial thickening.

Figure 3 High-resolution CT of the chest after starting antitubercular drugs, showing partial regression of interstitial thickening and fine nodular lesions compared with the previous study.

and calcium analysis were then sent for. ACE was 367 IU/L and calcium 11.8 mg/dL. So the patient was started on steroids, to which she responded. The patient was considered to have a dual pathology of sarcoidosis as well as TB and discharged on ATD and steroids. She recovered well on treatment and remained relapse-free on further follow-up visits.

DISCUSSION

TB and sarcoidosis are chronic granulomatous conditions that mimic each other clinically and histologically. So when they coexist, it remains a challenging task to diagnose them individually and treat accordingly. Coexistence of both these entities has sometimes been referred to as tuberculous sarcoidosis.⁵ It shows mainly three patterns (1) patients who have TB subsequently develop sarcoidosis, (2) patients develop concomitant sarcoidosis and TB; and (3) patients with chronic sarcoidosis develop TB due to treatment-related immunity suppression.⁵

Our patient presented with chronic cough and fever and her chest X-ray revealed bilateral miliary mottling. Although miliary mottling in chest X-rays may be also found in sarcoidosis, fungal

Figure 4 Bone marrow trephine biopsy showing hypercellular marrow, a few epithelioid cell granulomas with mild caseous necrosis (arrow) and occasional Langan's giant cells.

Figure 5 Transbronchial lung biopsy specimen showing ill-defined epithelioid granulomas without caseous necrosis (arrow).

infections and pneumoconiosis,⁶ due to the high prevalence of TB in India we first considered disseminated TB and the patient was started on ATD. Moreover, she had a history of previous intake of ATD due to tubercular lymphadenitis. She responded clinically to ATD and BAL fluid culture later revealed positive growth of MTB. But the dilemma developed as the patient did not show sustained response to ATD and had frequent recurrences. So we considered a second ongoing pathology. Although initial HRCT of the chest showed diffuse interstitial thickening, it later developed a reticulonodular pattern. The patient also showed raised ACE and calcium levels. Therefore, considering sarcoidosis, steroid therapy was initiated; due to the very high risk of progression of the TB infection, cotreatment of sarcoidosis and TB with steroids was exceptional. But the patient recovered well on both steroid therapy and ATD. Histology of bone marrow biopsy showed granuloma with caseous necrosis while

Figure 6 Chest X-ray posteroanterior view during recurrence on follow-up showing a bilateral diffuse interstitial reticulonodular pattern.

the transbronchial biopsy revealed granuloma without caseation. Although granuloma with caseous necrosis is characteristic of tuberculous lesions, non-necrotising granulomas are also found in TB.⁷ Similarly, necrotising granulomas may be found in sarcoidosis.⁷ Detection of MTB DNA in 50%, and non-TB mycobacterial DNA in a further 20% of patients with sarcoidosis, has shown possible connections between the two entities.⁸ A case report on asymptomatic stage I sarcoidosis complicated with pulmonary TB has recently been published.⁹ Few other case reports have also shown a diagnostic dilemma similar to ours when both these conditions affected patients concurrently.^{10–13}

Learning points

- ▶ Tuberculosis and sarcoidosis are chronic granulomatous conditions affecting the lungs and other organs.
- ▶ Rarely they may coexist.
- ▶ There remains a diagnostic challenge when tuberculosis and sarcoidosis occur concomitantly.

Acknowledgements Professor AK Saha and Dr Anirban Sarkar for guiding us to reach the diagnosis.

Contributors SKM and SSM were the treating physicians; SG wrote the manuscript; SC reviewed the literature.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Gal A, Koss M. The pathology of sarcoidosis. *Curr Opin Pulm Med* 2002;8:445–51.
- 2 Hance AJ. The role of mycobacteria in the pathogenesis of sarcoidosis. *Semin Respir Infect* 1998;13:197–205.
- 3 Drake WP, Dhason MS, Nadaf M, *et al.* Cellular recognition of Mycobacterium tuberculosis ESAT-6 and KatG peptides in systemic sarcoidosis. *Infect Immun* 2007;75:527–30.
- 4 Baughman RP, Nunes H. Therapy for sarcoidosis: evidence-based recommendations. *Expert Rev Clin Immunol* 2012;8:95–103.
- 5 Shah JR, Hede J, Mathur RS. Diagnostic criteria of tuberculous sarcoidosis. *Lung India* 2009;26:86–8.
- 6 Boitsios G, Bankier AA, Eisenberg RL. Diffuse pulmonary nodules. *AJR Am J Roentgenol* 2010;194:W354–66.
- 7 Danila E, Zurauskas E. Diagnostic value of epithelioid cell granulomas in bronchoscopic biopsies. *Intern Med* 2008;47:2121–6.
- 8 Saboor SA, Johnson NM, Mc Fadden J. Detection of mycobacterial DNA in sarcoidosis and tuberculosis with polymerase chain reaction. *Lancet* 1992;339:1012–15.
- 9 Papaetis GS, Pefanis A, Solomon S, *et al.* Asymptomatic stage I sarcoidosis complicated by pulmonary tuberculosis: a case report. *J Med Case Rep* 2008;2:226–9.
- 10 Litinsky I, Elkayam O, Flusser G, *et al.* Sarcoidosis: TB or not TB? *Ann Rheum Dis* 2002;61:385–6.
- 11 Noppen M. Difficult diagnosis in granulomatous lung disease: sarcoidosis, tuberculosis or both? *Eur J Intern Med* 1994;5:283–6.
- 12 Wong CF, Yew WW, Wong PC, *et al.* A case of concomitant tuberculosis and sarcoidosis with mycobacterial DNA present in the sarcoid lesion. *Chest* 1998;114:626–9.
- 13 Meckenstock R, Therby A, Chapelon-Abrie C, *et al.* Concomitant axillary mycobacteriosis and neuro-sarcoidosis: diagnostic pitfalls. *BMJ Case Rep* 2011;2011:pii: bcr0320114043.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow