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Treatment of disseminated TB with drug induced hepatitis/case study

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Abstract

Tuberculosis (TB) is one of disease that affects people of all age groups in many countries. The incidence of new is decreasing at rate about 2%/year due to the advances in medical diagnosis and treatment. The primary TB infection or reactivation of latent TB can be spread as result of impaired cell-mediated immunity resulted in uncontrolled disseminated of Mycobacterium tuberculosis through lymphohematogenous system. While, immunocompromise patients such as HIV/AIDS infection, use of immunosuppressive drugs, organ transplant, malnutrition, alcohol use, pregnancy, silicosis, and underlying malignancy are at high risk for development of Miliary TB. It usually has an insidious clinical manifestation including fever, weight loss, night sweats, and little in the way of localizing symptoms or signs. There may be concurrent TB meningitis with associated symptoms. A 35-year-old male has known case of pulmonary TB and HCV before three years ago. Presented to emergency department with fever since 3-weeks ago, abdomen pain, headache since 10 days.

Keywords: Miliary Tuberculosis (TB), HCV

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Introduction

Tuberculosis remains a major public health problem worldwide. The worldwide rise in drug-resistant tuberculosis, the resurgence of tuberculosis, and the co-infection of tuberculosis and HIV have brought new challenges to global tuberculosis control. Miliary TB (MTB) is a common form of disseminated TB that can affect multiple organs. The liver is involved and is often accompanied by liver damage. Anti-tuberculosis drugs can also cause liver damage. Drug-induced hepatitis is one of the most common adverse reactions. If drug-induced hepatitis is ignored in the treatment of disseminated tuberculosis, liver damage, liver failure, and death will occur. Currently, there are no articles about the treatment of disseminated tuberculosis with hepatitis. We will focus on this in this case report.

Disseminated tuberculosis is a life-threatening condition affecting the liver. The use of anti-tuberculous drugs can lead to drug-induced hepatitis. When suspected or faced with a diagnosis of disseminated TB, especially for immigrants or persons who have not previously been assessed for LTBI, it is important to act as soon as possible in order to initiate effective therapy. We present a case where the treatment of disseminated TB with drug-induced hepatitis led to life-threatening symptoms in the patient.

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The global spread of tubercle bacillus has much in common with the geographical distribution of resources and includes about one-third of the world's population. Low-income countries have higher TB rates, and TB incidence is often higher in developing countries. Although tuberculosis can occur at any age, it is becoming more and more common among young adults than in low-income people with low bank education. Indeed, TB is especially prevalent in high-income countries. The low lymphocyte count increases the incidence of active TB by 3.3 times in people older than 50 years and is more common in males than in females.

Drug-Induced Hepatitis: Mechanisms and Risk Factors

The mechanisms have been postulated as an immunoallergic response or a cytotoxic response for drugs: development of the reaction depends on an unknown combination of factors. Idiosyncratic responses have been shown to involve multiple immune pathways, which are predictable in mechanistic terms. The distinction between direct and immune cytotoxic mechanisms of hepatocellular injury is not always clear. In common to all these theories, the mechanism appears to increase the rate of cholestasis by the hepatocyte, which is the next step. The hepatocyte may die as a result of these processes, type I cell death is overcome because microfilaments maintain the cell in the shape of apoptotic cells, which are reported to have several mice, unlike exploded rubbers reported in dogs where the problem was first identified. In other words, it's an alternative to the aggression caused by the toxin. Liver injury with antibody-coated virus (anti-HA Ab) can be caused by the formation of OVA-C immune complexes, although there's a theory that cannot occur within 30 days or more based on a number of alternative mechanisms. As a damage both physical and cytotoxic in some cases in response to mefenam - dominated are often more susceptible to hepatic KB macromolecules damaged by paracetamol and its reactive metabolite (nomogram 2020). Whether or few firsthand of these starts to cause the development of an optimal reaction is based on (1) genuine inherent or genetic susceptibility (e.g., paracetamol and CYP2E20 polymorphisms of CYP2E17) With respect to paracetamol skin rashes, the exact mechanism is not yet established. Information of the Panel of Experts 2017; (2) the proportion of cells being autoxidized by the meopause-meddling drug metabolism leading to toxic metabolites and changing the composition of peroxisome and hepatic macrophages.

Case Presentation

From the onset, the patient showed no resistance to tuberculosis; biochemical indicators of liver injury progressed while the first-line anti-tuberculosis drugs were administered. Therefore, we successfully cured the patient with an 18-month treatment regimen composed of moxifloxacin, cycloserine, and levofloxacin. The favorable outcome suggested potential treatment indicators for tuberculosis, i.e. drug-induced hepatitis. Also, more is to be confirmed in large-sample randomized controlled trials.

A 35-year-old male was referred to us for abdominal pain and fever of 30 days' duration. He was brought up in an insufficiently ventilated environment. The Mantoux skin test and T-cell

spot of tuberculosis indicated tuberculosis infection. Sputum smears and cultures under fluorescent light both tested positive for acid-fast bacteria, and bone marrow cultures were negative for fungi, bacteria, and mycobacterium. Blood tests revealed higher levels of amino transferase and bilirubin compared with the upper limits of the average. Enhanced abdominal computed tomography showed local thickening of the peritoneum, exudation in the intestinal canal, and enlarged lymph nodes. These findings were further demonstrated by magnetic resonance imaging. The detailed processes and diagnostic criteria have been reported elsewhere. Therefore, the man-to-female ratio of 20 cases was 6.75. All commonly used anti-tuberculosis drugs were given isoniazid, rifampicin, protionamide, and pyrazinamide for 2-152 days, and the median time of drugs administration was 16 days. The patient's median ALT level was 192.2 U/L, and 120 mg/dL at the highest level, and the median time was 41 days. All patients were cured; 14 cases were treated with levofloxacin, 4 with moxifloxacin, and 2 with streptomycin. Eight patients received corticoids. The diagnostic delay of drug-induced hepatitis ranged from 1 to 48 days, with a median of 17, and the first 11 cases took place at the 5th and 26th days. When the abnormality of liver damage was first observed, the time spent on recovery ranged from 3 to 20 days with a median of 8 days.

Outcome and Follow-Up

We initiated antituberculosis treatment with moxifloxacin, ethambutol, and meropenem using a reduced dose. Five days later, the blood chemistry showed a normalization of the liver parameters, while the INR was still slightly increased (1.35). We received a notice from the resistance institute that the isolate was sensitive to rifampicin and isoniazid, and the patient was started on standard treatment on day 31. Due to the improved liver function test (LFT), we restarted standard doses of isoniazid and rifampicin but had to lower the moxifloxacin dose. The patient was discharged from the hospital after six weeks of the intensive phase of treatment. Liver failure would have required transplantation and/or a long hospital stay in a living donor transplantation center or after successful conservative treatment and treatment of haemochromatosis and severe nutritional state in an institution for specialized tuberculosis treatment.

Competing interests

The authors declare no conflict of interest.

Authors' contributions

All authors shared in the conception and design and interpretation of data, drafting of the manuscript and critical revision of the case study for intellectual content and final approval of the version to be published. All authors read and approved the final manuscript.

References

1. Sharma SK, Mohan A. Tuberculosis: from an incurable scourge to a curable disease-journey over a millennium. Indian J Med Res 2013; 137: 455-493.
2. Kıraç FS. Is ethics approval necessary for all trials? A clear but not certain process. Mol Imaging Radionucl Ther 2013; 22: 73-5.
3. Eisenach KD, Cave MD, Bates JH, et al. Polymerase chain reaction amplification of a repetitive DNA sequence specific for Mycobacterium tuberculosis. J Infect Dis 1990; 161: 977-81.
4. Mert A, Ozaras R. Clinical importance of miliary pattern in the chest X-ray of a patient with fever of unknown origin. Intern Med Tokyo Jpn 2005; 44: 161.
5. Sharma SK, Mohan A, Sharma A, et al. Miliary tuberculosis: new insights into an old disease. Lancet Infect Dis 2005; 5: 415-30.
6. World Health Organization. Global tuberculosis report 2015. Geneva, Switzerland: World Health Organization; 2015.
7. Rajagopala S, Sankari S, Kancherla R. Miliary Sarcoidosis: does it exist? A case series and systematic review of literature. Sarcoidosis Vasc Diffuse Lung Dis 2020; 37(1): 53-65.
8. Tana C, Donatiello I, Coppola MG, Ricci F, et al. CT Findings in Pulmonary and Abdominal Sarcoidosis. Implications for Diagnosis and Classification. J Clin Med 2020; 9(9): 3028.
9. McGuinness G, Naidich DP, Jagirdar J, et al. High resolution CT findings in miliary lung disease. J Comput Assist Tomogr 1992; 16: 384-90.
10. Kim JH, Langston AA, Gallis HA. Miliary tuberculosis: epidemiology, clinical manifestations, diagnosis, and outcome. Rev Infect Dis 1990; 12: 583-90. https://doi.org/10.1093/clinids/12.4.583
11. Myers JN. Miliary, central nervous system, and genitourinary tuberculosis. Dis Mon 2007; 53(1): 22-31. https://doi.org/10.1016/j.disamonth.2006.10.003
12. Lui G, Wong RY, Li F. High mortality in adults hospitalized for active tuberculosis in a low HIV prevalence setting. PLoS One. 2014; 9(3): e92077. https://doi.org/10.1371/journal.pone.0092077
13. Aksenova VA, Sen'kina TI. Extrapulmonary tuberculosis in children in Russia (epidemiology, clinical forms and their study. Probl Tuberk 2001; (4): 6-9.
14. Mert A, Arslan F, Kuyucu T, et al. Miliary tuberculosis: Epidemiological and clinical analysis of large-case series from moderate to low tuberculosis endemic Country. Medicine (Baltimore) 2017; 96(5): e5875. https://doi.org/10.1097/MD.0000000000005875
15. Cunha BA, Krakakis J, McDermott BP. Fever of unknown origin (FUO) caused by miliary tuberculosis: diagnostic significance of morning temperature spikes. Heart Lung 2009; 38(1): 77-82. https://doi.org/10.1016/j.hrtlng.2008.03.002
16. Yilmaz T, Selcuk E, Polat N, Mutlu K. Choroidal tuberculoma showing paradoxical worsening in a patient with miliary TB. Ocul Immunol Inflamm 2015; 23(1): 97-9. https://doi.org/10.3109/09273948.2014.943350
17. Criado E, Sanchez M, Ramirez J, et al. Pulmonary sarcoidosis: typical and atypical manifestations at high-resolution CT with pathologic correlation. Radiographics: a review publication of the Radiological Society of North America, Inc 2010; 30(6): 1567-86. https://doi.org/10.1148/rg.306105512
18. Koyama T, Ueda H, Togashi K, Umeoka S, Kataoka M, Nagai S. Radiologic manifestations of sarcoidosis in various organs. Radiographics: a review publication of the Radiological Society of

North America, Inc. 2004; 24(1): 87-104.
https://doi.org/10.1148/rg.241035076

19. Gupta D, Agarwal R, Aggarwal AN, Jindal SK. Sarcoidosis and tuberculosis: the same disease with different manifestations or similar manifestations of different disorders. Curr Opin Pulm Med 2012; 18(5): 506-16.
https://doi.org/10.1097/MCP.0b013e3283560809
20. Kumar P, Jaco MJ, Pandit AG, et al. Miliary sarcoidosis with secondary Sjogren's syndrome. The Journal of the Association of Physicians of India 2013; 61(7): 505-7.
21. Matsuura S, Mochizuka Y, Oishi K, et al. Sarcoidosis with Pancreatic Mass, Endobronchial Nodules, and Miliary Opacities in the Lung. Internal medicine (Tokyo, Japan) 2017; 56(22): 3083-7.
https://doi.org/10.2169/internalmedicine.8916-17
22. Lai RP, Meintjes G, Wilkinson RJ. HIV-1 tuberculosis-associated immune reconstitution inflammatory syndrome. Semin Immunopathol 2016; 38: 185-198.
https://doi.org/10.1007/s00281-015-0532-2
23. Bell LC, Breen R, Miller RF, Noursadeghi M, Lipman M. Paradoxical reactions and immune reconstitution inflammatory syndrome in tuberculosis. Int J Infect Dis 2015; 32: 39-45.
https://doi.org/10.1016/j.ijid.2014.12.030
24. Cevaal PM, Bekker LG, Hermans S. TB-IRIS pathogenesis and new strategies for intervention: Insights from related inflammatory disorders. Tuberculosis (Edinb) 2019; 118: 101863.
https://doi.org/10.1016/j.tube.2019.101863
25. de Sa NBR, Ribeiro-Alves M, da Silva TP, et al. Clinical and genetic markers associated with tuberculosis, HIV-1 infection, and TB/HIV-immune reconstitution inflammatory syndrome outcomes. BMC Infect Dis 2020; 20: 59.
https://doi.org/10.1186/s12879-020-4786-5
26. Narendran G, Andrade BB, Porter BO, et al. Paradoxical tuberculosis immune reconstitution inflammatory syndrome (TB-IRIS) in HIV patients with culture confirmed pulmonary tuberculosis in India and the potential role of IL-6 in prediction. PLoS One 2013; 8: e63541.
https://doi.org/10.1371/journal.pone.0063541
27. Eshun-Wilson I, Havers F, Nachega JB, et al. Evaluation of paradoxical TB-associated IRIS with the use of standardized case definitions for resource-limited settings. J Int Assoc Physicians AIDS Care (Chic) 2010; 9: 104-108.
https://doi.org/10.1177/1545109710361537
28. Orme IM, Robinson RT, Cooper AM. The balance between protective and pathogenic immune responses in the TB-infected lung. Nat Immunol 2015; 16: 57-63.
https://doi.org/10.1038/ni.3048
29. Pang Y, An J, Shu W, et al. Epidemiology of Extrapulmonary tuberculosis among inpatients, China, 2008-2017. Emerg Infect Dis 2019; 25: 457-464.
https://doi.org/10.3201/eid2503.180572
30. Yodmalai S, Chiewchanvit S, Mahanupab P. Cutaneous miliary tuberculosis in a renal transplant patient: a case report and literature review. Southeast Asian J Trop Med Public Health 2011; 42(3): 674-8.

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