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A CASE REPORT: MULTIDRUG-RESISTANT TUBERCULOSIS IN A 53-YEAR-OLD PATIENT

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Abstract : A Case Report: Multidrug-Resistant Tuberculosis In A 53-Year-Old Patient. *A 53-year-old man with multidrug-resistant tuberculosis (MDR-TB) presented with clinical symptoms such as cough with yellow-white sputum for a month, shortness of breath, fever, night sweats, and weight loss. After completing six months of TB treatment in 2010, he developed MDR-TB, proven by resistance to rifampicin. Initial diagnosis by chest X-ray showed signs of pulmonary TB and right pleural effusion, while the sputum test confirmed Mycobacterium tuberculosis with moderate bacterial load. Laboratory results showed anemia, leukocytosis, and hypoalbuminemia. The patient's therapy included a combination of bedaquiline, levofloxacin, linezolid, clofazimine, cycloserine, and vitamin B6, along with additional treatments such as antibiotics, symptomatic therapy, and nutritional support. The medical team conducted regular monitoring and consultation with pulmonary, psychiatry, and nutrition specialists to ensure treatment compliance. This case highlights the challenges in managing MDR-TB, especially in patients with a history of TB. Early detection of drug resistance and prompt implementation of appropriate therapy are essential to improve treatment outcomes and prevent further spread. This report emphasizes the need for a multidisciplinary approach and close monitoring in the management of MDR-TB.*
Keywords: *Drug Resistant Tuberculosis, Long-term Regiment, Tuberculosis*

Abstract : Laporan Kasus: Tuberkulosis Multidrug Resistant Pada Pasien 53 Tahun. Seorang pria 53 tahun dengan tuberkulosis multi resisten obat (MDR-TB) menunjukkan gejala klinis seperti batuk berdahak kuning putih selama sebulan, sesak napas, demam, keringat malam, dan penurunan berat badan. Setelah menyelesaikan pengobatan TB enam bulan pada 2010, ia mengalami MDR-TB, terbukti dengan resistensi terhadap rifampicin. Diagnosis awal melalui rontgen dada menunjukkan tanda TB paru dan efusi pleura kanan, sementara tes dahak mengonfirmasi Mycobacterium tuberculosis dengan beban bakteri moderat. Hasil laboratorium menunjukkan anemia, leukositosis, dan hipoalbuminemia. Terapi pasien mencakup kombinasi bedaquiline, levofloxacin, linezolid, clofazimine, cycloserine, dan vitamin B6, disertai perawatan tambahan seperti antibiotik, terapi gejala, dan dukungan nutrisi. Tim medis melakukan pemantauan rutin serta konsultasi dengan spesialis paru, psikiatri, dan gizi untuk memastikan kepatuhan pengobatan. Kasus ini menyoroti tantangan dalam menangani MDR-TB, terutama pada pasien dengan riwayat TB sebelumnya. Deteksi dini resistensi obat dan penerapan segera terapi yang tepat sangat penting untuk meningkatkan hasil

pengobatan serta mencegah penyebaran lebih lanjut. Laporan ini menegaskan perlunya pendekatan multidisiplin dan pemantauan ketat dalam penanganan MDR-TB.
Kata Kunci: Regiment jangka panjang, Tuberculosis, Tuberkulosis resisten obat

INTRODUCTION

Tuberculosis (TB) is a substantial worldwide health obstacle. Approximately 10 million individuals contract the illness annually, resulting in 1.4 million documented fatalities in 2019 alone. Mycobacterium tuberculosis, the primary pathogen, mostly targets the lungs but can potentially disseminate to other organs. Although there are effective treatment regimens available, the rise of multidrug-resistant TB (MDR-TB) has made TB control efforts more challenging. Multi-drug resistant tuberculosis (MDR-TB) is characterized by its resistance to both isoniazid and rifampicin, which are the two most potent drugs employed in the treatment of tuberculosis. Consequently, MDR-TB necessitates a more extended and intricate treatment regimen (Nahid., et al. 2019). Tuberculosis is a respiratory disease that affects many people around the world, and it is found in many developing countries because of one of the facts that affected them from a poor socio-economic point of view. Identification of activities that can be done on the ground can be one of the major milestones in the eradication of tuberculosis outbreaks. Identification can start with management, prevention, and enforcement (Mustofa et al., 2023).

This case report provides a comprehensive account of the clinical manifestation, diagnostic procedure, and treatment of a 53-year-old male patient identified as Tn. A who was diagnosed with MDR-TB (multi-drug-resistant tuberculosis). The patient had previously had effective treatment for tuberculosis (TB) in 2010. However, the patient currently exhibits classic signs of TB, such as a chronic cough, fever, night sweats, and substantial weight loss. Rifampicin-resistant tuberculosis worsened the patient's situation, necessitating a thorough and interdisciplinary treatment strategy (Zignol m., et al. 2016). In the studies that have been carried out, there are complications in the outbreak of chronic tuberculosis, such as the occurrence of pneumothorax or the accumulation of radiation that occurs spontaneously between the lungs and the chest wall. This complication is usually characterized by symptoms of chest discomfort and dyspnea (Mustofa & Antoni, 2023).

Managing MDR-TB entails the use of second-line medications, which are often less efficient and more harmful and necessitate longer treatment periods compared to first-line therapy. Timely identification and suitable therapy are essential in order to halt the spread of the disease and improve the patient. This report emphasizes the challenges in diagnosing and treating MDR-TB and underscores the importance of adherence to treatment protocols and continuous patient monitoring (Dheda, K., et al. 2017).

CASE REPORT

This case report chronicles the medical experience of Tn. A, a 53-year-old male, describes his experience with multidrug-resistant tuberculosis. After successfully completing a comprehensive tuberculosis (TB) treatment in 2010, he experienced a series of symptoms that lasted one month. These symptoms included a cough that produced phlegm, difficulty breathing, occasional fever, excessive sweating at night, and a notable decrease in body weight (World Health Organization, 2020).

Table 1. Laboratory examinations

	Clinical laboratory findings	Normal Range
Complete Blood Counts: Hb/Ht/WBC/ Platelets	9.8/29/14.730*/559.000	13,2-17,3/40-52/3.800-10.600/150.000-440.000
Differential count Neutrophils/Lymphocytes /Monocytes/ Eosinophils/Basophils	94*/3*/4/0/0/3*	50-70/25-40/2-8/0-1/2-4/3-5
Na/K/Cl	135/4,6/8,6	135-147/3,5-5,0/8,95-105
Ureum/ Creatinine	24/0,83	18-55/0,6-1,2
Random Blood sugar test	77	70-200
Albumin	2.8*	3.5-5.2
SGOT/SGPT	32/35	0-35/0-35
Bilirubin T/D/I	0.3/0.2/0.1	<0.1/<0.2/<1
HIV	Non-reactive	
HbsAg/HAV/HCV	Non-reactive	Non-reactive
Rapid molecular test using Xpert MTB/RIF	Positive Rif Resistant	

Referring to table 1 results of the patient's blood analysis, there is an anomaly, that is, there is a picture of anemia seen from the blood hemoglobin levels below the standard of 9.8, there is an increase in the number of leukocytes, especially neutrophilic levels, that increased far beyond the normal boundary, which indicates the presence of leucocytosis, and in the latter, there are abnormalities in the level of albumin; low levels of albumin below the normal level are 2.8, indicating hypoalbumin. Initial examinations revealed anemia, leukocytosis, and hypoalbuminemia.

Figure 1. The radiological examination revealed the presence of pulmonary tuberculosis and right pleural effusion.

As seen in Figure 1, a picture is displayed. The chest X-ray showed pulmonary TB with right pleural effusion. Testing of the sputum revealed Mycobacterium tuberculosis with a moderate bacterial load that was not susceptible to rifampicin (Mustofa, *et al.,* 2023). The diagnosis of MDR-TB led to a vigorous treatment regimen for the patient, which included bedaquiline, levofloxacin, linezolid, clofazimine, cycloserine, and vitamin B6. In addition,

the patient received supportive therapy such as antibiotics, nutritional assistance, and treatments to alleviate symptoms (Xie, Y., et al. 2017).

This example emphasizes the intricate and difficult nature of managing MDR-TB, emphasizing the significance of detecting it early, starting the right medication promptly, and using a multidisciplinary approach to provide care. Consistent surveillance and expert consultations were crucial for effectively addressing any problems and ensuring strict adherence to the treatment, with the primary objective of enhancing patient outcomes and halting the transmission of the disease (Esmail, A., et al. 2014)).

DISCUSSION

This case report demonstrates the intricacies associated with the treatment of multidrug resistant tuberculosis (MDR-TB), especially in individuals who have previously received therapy for tuberculosis. Mr. A, a 53-year-old man, had typical signs of tuberculosis and experienced substantial weight loss, leading to a clinical suspicion of tuberculosis recurrence. Although he had been successfully treated for the disease in 2010, the fact that it has reappeared and he has now been diagnosed with MDR-TB underscores the ongoing difficulties in controlling and managing tuberculosis.

MDR-TB poses a significant public health concern because it is resistant to both isoniazid and rifampicin, the two most effective main anti-TB medications. Managing multidrug-resistant tuberculosis (MDR-TB) is a more complex procedure since second-line medications are typically less effective, more harmful, and need longer treatment durations (Poty, *et al.,* 2024). The treatment strategy for Tn. A included the administration of bedaquiline, levofloxacin, linezolid, clofazimine, cycloserine, and vitamin B6. The choice of these pharmaceuticals was determined by the drug susceptibility profile and the need for an efficient treatment strategy to address the drug-resistant strain of tuberculosis (Lange., wt al. 2014).

Prompt identification and prompt initiation of appropriate therapy are crucial for improving patient outcomes and preventing the further dissemination of multidrug-resistant tuberculosis (MDR-TB). The prompt detection of rifampicin resistance by sputum testing facilitated the timely implementation of a treatment regimen tailored to multidrug-resistant tuberculosis (MDR-TB) (Singh and Chibale, 2021). The patient's treatment regimen was augmented with supportive care, encompassing the administration of antibiotics to combat secondary infections, provision of nutritional assistance, and implementation of symptomatic therapies, aimed at managing the consequences of the condition and improving overall health (Brigden. 2014).

Vitamin B6 in TB treatment is highly recommended, as vitamin B6 treatment can be associated with second-line TB treatment, such as cycloserin and isoniazid use. The use of vitamin B6 has the benefit of preventing the occurrence of peripheral neuropathy. Peripheric neuropathies can occur due to the use of the drugs cycloserin and isoniazide, so prevention of the negative effects of this medication is supplied by the consumption of vitamin B6, so that the side effects of MDR-TB treatment in combination can be prevented (World Health Organization, 2022).

In the case of the above patient, his low hemoglobin values are characterized by anemia. The cause of anemia in the patient is the infestation of MDR TB experienced because, in the chronic MDR phase of TB, there is disruption of iron metabolism, so there is a decrease in erythropoietin, so when erythropoietin is low, red blood cells are difficult to form. In addition, in MDR-TB, there is cytocystic interleukin-6 (IL-6) and alpha-factor necrosis (TNF-α), which cause inhibition of the spinal cord, the production of red blood cells, and iron disorders (Weiss G, 2015). Another cause of anemia in MDR-TB patients is the presence of drug toxicity, which can occur due to malnutrition and cormobidity. The drug toxicity occurs due to the inhibition of linezolid, which

has side effects of spinal cord suppression, so that the production of red blood cells decreases. Malnutrition and cormobidity factors result from a lack of iron, vitamin B12, and folic acid in red blood cell synthesis. Comorbid disorders, such as the presence of HIV, can cause fairly significant anemia (Lee et al., 2012).

In the above cases, there is an increase in leukocytes above the normal threshold due to the mechanisms of physiological stress, inflammatory response, and chronic inflammation. Of the three mechanisms, that's what causes an excessive increase in leukocytes. Pro-inflammatory cytokines such as TNF-α, IL-1, and IL-6 trigger inflammatory responses. Further, chronic inflammation in MDR TB can affect the release of cortisol, which can stimulate the production of leukocytes in the bone marrow(Syal, 2014). And in the case of TB MDR above, it was also found that hypoalbumin or body albumin levels that are below normal limits are often associated with the presence of malnutrition and an inflammatory response that occurs in MDR TB patients(Katz, 2011).

A comprehensive plan for addressing MDR-TB must incorporate input from a variety of disciplines. To address potential side effects and offer comprehensive treatment, it was critical to monitor and consult with specialists in cancer, psychiatry, ophthalmology, and nutrition on a regular basis. This approach also emphasized the significance of continually teaching and supporting patients in order to help them stick to the difficult and lengthy treatment regimen (Udwadia, Z., et al. 2014).

This example underscores the ongoing challenges of controlling tuberculosis (TB), particularly the critical need for effective public health policies to prevent TB from recurring and to avoid the development of treatment resistance. In order to effectively battle multidrug-resistant tuberculosis (MDR-TB), continuous monitoring, extensive patient education, and rigorous adherence to treatment regimens are essential. Future projects must focus the development of more potent and less dangerous drugs, as well as the upgrading of patient care services, in order to successfully treat the condition and avoid transmission within communities (Pontali., et al. 2013).

CONCLUSION

The patient's medical condition's progression highlighted the importance of ongoing monitoring, professional advice, and rigorous adherence to treatment procedures in order to control possible difficulties and achieve positive outcomes. This example emphasizes the need for strong public health initiatives, patient education, and support networks to prevent tuberculosis recurrence and limit the spread of multidrug-resistant tuberculosis (MDRTB). Future efforts should concentrate on improving diagnostic procedures, finding more efficient and less harmful medicines, and providing full patient care to confront the chronic worldwide problem of tuberculosis.

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