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Alcohol use disorder and abdominal tuberculosis: A Case series highlighting treatment challenges, hepatotoxicity, and clinical outcomes

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Abstract
Alcohol use disorder (AUD) significantly influences the clinical presentation, progression, and treatment outcomes of tuberculosis (TB), particularly abdominal tuberculosis (ATB). We present a case series of four patients with chronic alcohol use and abdominal TB, highlighting diagnostic challenges, treatment modification, hepatotoxicity, and adherence issues. Alcohol was associated with advanced disease, treatment default, and increased risk of liver injury. Integrated management including de-addiction is essential for improved outcomes.

Keywords: Alcohol use disorder (AUD), abdominal tuberculosis (ATB), tuberculosis (TB), hepatotoxicity

Introduction
Tuberculosis remains a major health burden in India, contributing to approximately 27% of global cases [1]. Extrapulmonary TB accounts for 15–20% of cases, with abdominal TB being a significant subset [2]. Alcohol use disorder is an important risk factor that impairs immunity, increases susceptibility to TB, and negatively impacts treatment adherence and outcomes [3]. This case series highlights the clinical challenges posed by the coexistence of alcohol use and abdominal tuberculosis.

Case Series
Case 1: Abdominal Tuberculosis with Alcohol-related Liver Disease
A middle-aged male with chronic alcohol intake (>15 years) presented with fever, weight loss, and abdominal distension. Ascitic fluid analysis revealed high protein, lymphocytic predominance, suggestive of tubercular etiology [2]. GeneXpert confirmed *Mycobacterium tuberculosis* [1]. Liver function tests were deranged, consistent with alcohol-related liver injury [3]. The patient was managed with a modified ATT regimen and strict alcohol abstinence, resulting in clinical improvement.

Case 2: Defaulter with Disseminated Tuberculosis
A chronic alcoholic with a history of treatment default presented with severe weight loss, fever, cough, and ascites. Imaging showed bilateral cavitary pulmonary lesions and abdominal lymphadenopathy. Microbiological confirmation established active TB. Alcohol-related immune suppression contributed to extensive disease [4]. Despite restarting ATT and counseling, poor adherence led to relapse risk, emphasizing the strong association between alcohol use and treatment default [5].

Case 3: Cirrhosis with Abdominal TB Mimicking Malignancy
A long-term alcoholic with cirrhosis presented with ascites, anorexia, and weight loss. Imaging suggested malignancy with omental caking; however, ascitic fluid showed low SAAG, high protein, and lymphocytic predominance. GeneXpert confirmed TB [1]. Abdominal TB is a known mimicker of malignancy in endemic regions [2]. Modified ATT and supportive care led to gradual improvement.

Case 4: ATT-induced Hepatotoxicity in Alcoholic Patient
A young alcoholic patient with abdominal TB developed jaundice and elevated liver enzymes (>5× normal) after initiation of ATT. Viral causes were excluded. ATT-induced hepatotoxicity was diagnosed, with alcohol acting as a major risk factor [6]. Hepatotoxic drugs were withheld and later reintroduced stepwise. The patient recovered with normalization of liver function.

Discussion
This case series demonstrates that alcohol use disorder significantly modifies the clinical course of abdominal tuberculosis. Alcohol impairs host immunity, leading to increased susceptibility, higher bacillary load, and disseminated disease [4]. It is also strongly associated with treatment default, which increases the risk of relapse and drug resistance [5].
Hepatic involvement is a major concern in alcoholic patients, either due to pre-existing liver disease or ATT-induced hepatotoxicity. First-line drugs such as isoniazid, rifampicin, and pyrazinamide further increase the risk of liver injury in these patients [6]. Diagnostic challenges are common, particularly when abdominal TB mimics malignancy or cirrhosis, necessitating reliance on ascitic fluid analysis and microbiological confirmation [2]. This case series provides real-world clinical insights into the complex interaction between alcohol use disorder and abdominal tuberculosis in a high-burden setting, highlighting practical challenges in diagnosis and management.

Conclusion
Alcohol use disorder is a critical determinant of disease severity, treatment adherence, and hepatotoxicity in abdominal tuberculosis, often leading to delayed diagnosis,

extensive disease, and increased risk of complications. It adversely affects immune response and treatment compliance, thereby contributing to poor clinical outcomes and higher chances of relapse or drug resistance. Effective management requires a comprehensive approach that includes early diagnosis, careful selection and modification of anti-tubercular therapy based on hepatic status, regular monitoring of liver function, and, most importantly, strict alcohol abstinence supported by counseling and de-addiction strategies to ensure sustained recovery and treatment success. Diagnosis was supported by a combination of radiological findings, ascitic fluid analysis, ADA levels, and microbiological confirmation using CBNAAT/GeneXpert, ensuring diagnostic accuracy.In this case series, 100% of patients had chronic alcohol exposure, 75% presented with advanced disease, and 50% demonstrated treatment-related complications, highlighting a strong association between alcohol use and adverse TB outcomes.This study emphasizes the need to consider alcohol use disorder as a key modifiable risk factor in tuberculosis control strategies.

Limitation

The study is limited by a small sample size and lack of long-term follow-up, which may affect generalizability. However, it provides important clinical observations relevant to routine practice.

Summary

This case series highlights the significant impact of alcohol use disorder on the clinical course of abdominal tuberculosis. Patients with chronic alcohol intake tend to present with advanced and disseminated disease, often associated with poor nutritional status, treatment default, and increased risk of hepatotoxicity. Diagnostic challenges are common, particularly when abdominal tuberculosis mimics malignancy or chronic liver disease. Alcohol further complicates management by impairing immunity, reducing treatment adherence, and increasing susceptibility to drug-induced liver injury. Successful outcomes require early diagnosis, individualized anti-tubercular therapy with careful monitoring of liver function, and strict alcohol abstinence. Integrating de-addiction strategies into tuberculosis care is essential to improve adherence, reduce complications, and enhance overall treatment success.

Recommendations

Based on this case series, it is strongly recommended that screening for alcohol use disorder should be made mandatory in all patients diagnosed with tuberculosis, particularly in high-burden settings. Early identification of alcohol dependence allows timely initiation of de-addiction interventions, which can significantly improve treatment adherence and outcomes. Baseline and periodic liver function monitoring should be routinely performed, especially in patients with known alcohol use, to detect hepatotoxicity early and guide appropriate modification of anti-tubercular therapy. Furthermore, integration of TB care with psychosocial support, nutritional rehabilitation, and community-based DOTS supervision is essential.

Strengthening public health strategies that address both tuberculosis and substance abuse as a combined entity will help reduce treatment default, relapse, and drug resistance.

Take-Home Message

This case series highlights that alcohol use disorder is not merely a coexisting condition but a major determinant of tuberculosis severity, treatment response, and clinical outcomes. Alcohol predisposes patients to delayed diagnosis, extensive disease, poor adherence, and increased risk of hepatotoxicity. Abdominal tuberculosis, in particular, can present with diagnostic ambiguity, often mimicking malignancy or liver disease, thereby requiring a high index of clinical suspicion. Effective management of such patients requires a holistic approach combining timely diagnosis, individualized anti-tubercular therapy, strict monitoring, and uncompromising emphasis on alcohol abstinence. Addressing alcohol use is therefore indispensable for achieving successful TB control and improving patient survival.

Ethical Consideration

This study was conducted as a retrospective observational case series using anonymized patient data. As per institutional practice and ICMR guidelines, formal ethical clearance was not required. Patient confidentiality was strictly maintained, and no identifiable information has been disclosed.

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