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Case Report

Sorafenib Induced Tumor Lysis Syndrome in Hepatocellular Carsinoma: A Case Report

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ABSTRACT
Sorafenib is used as the primary treatment for advanced Hepatocellular Carcinoma (HCC). However, while Tumor Lysis Syndrome (TLS) is uncommon, it can be a severe and potentially life-threatening complication in HCC patients, especially those with a high tumor burden. This article details a case involving an HCC patient who was administered Sorafenib as initial first line therapy. After 7 days of treatment, TLS was diagnosed based on hallmark findings of hyperuricemia, hyperkalemia and acute kidney injury. Despite discontinuation of Sorafenib and supportive care measures, the patient's condition rapidly deteriorated. This case highlights a rare but severe complication that can arise shortly after initiating Sorafenib therapy for HCC. Recognizing TLS is essential for the early detection and management of TLS in such patients.

Keywords: Sorafenib, Hepatocellular carcinoma, Tumor lysis syndrome, HCC, TLS.

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INTRODUCTION

The association of Tumor Lysis Syndrome (TLS) with hematological malignancies is well known. However, TLS is not frequently observed in Hepatocellular Carcinoma (HCC).[3,4] In cases of HCC where locoregional therapies such as Transarterial Radioembolization (TARE) or Transarterial Chemoembolization (TACE) are not applicable, Sorafenib treatment is often utilized.[3] Although rare, Sorafenib-associated tumor lysis syndrome can occur. This case presentation aims to provide guidance for clinicians in managing this complication.

CASE PRESENTATION

A 68-year-old male patient with non-metastatic hepatocellular carcinoma presented to the Emergency Room (ER) with symptoms of nausea, vomiting and melena. He had commenced Sorafenib 400 mg daily one week prior to his ER visit. Upon evaluation, laboratory results revealed elevated creatinine levels (1.5 mg/dL; normal range 0.7-1.3 mg/dL), increased AST (352 U/L; normal range <35 U/L), normal ALT (44 U/L; normal range <50 U/L), elevated total bilirubin (3.2 mg/dL; normal range 0.2-1.1 mg/dL), prolonged prothrombin time (14.5 sec) and normal albumin levels (38 g/L; normal range 32-48 g/L). Imaging studies showed multiple hepatocellular masses, up to 8 cm in size, but no other significant findings.

The patient exhibited worsening renal function and anuria, leading to the initiation of hemodialysis following nephrology consultation. He was subsequently admitted to the Intensive Care Unit (ICU) with acute renal failure and gastrointestinal bleeding, which was suspected to be a side effect of Sorafenib.[1]

On his first ICU Day, laboratory values indicated significantly elevated BUN (162 mg/dL; normal range 19-62 mg/dL), creatinine (3.92 mg/dL; normal range 0.7-1.3 mg/dL), uric acid (14.1 mg/dL; normal range 3.7-9.2 mg/dL), phosphate (8.3 mg/dL; normal range 2.5-5.1 mg/dL) and decreased calcium (7.9 mg/dL; normal range 8.7-10.4 mg/dL). Additionally, AST (2850 U/L; normal range <35 U/L), ALT (359 U/L; normal range <50 U/L), total bilirubin (10.8 mg/dL; normal range 0.2-1.1 mg/dL), prothrombin time (29.6 sec) and albumin (24 g/L; normal range 32-48 g/L) were notably abnormal. ECG results showed QRS elevation but were not indicative of acute coronary syndrome, as confirmed by the cardiology department.

Given the high uric acid levels, the patient was treated with Allopurinol (150 mg daily). The diagnosis of TLS was confirmed and nephrology recommended continued hemodialysis with ultrafiltration.[2] The patient underwent daily hemodialysis and ultrafiltration throughout his 3-day ICU stay. On the final day, during hemodialysis, the patient experienced cardiac arrest. Cardiopulmonary resuscitation was initiated and defibrillation was performed following detection of ventricular fibrillation. Despite 45 min of intensive intervention, the patient was declared deceased.

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DISCUSSION

Hepatocellular Carcinoma (HCC) is the most common primary liver cancer and is the third leading cause of death among solid tumors, after lung and colon cancers. Systemic targeted treatments, such as Sorafenib, are frequently used for patients with intermediate to advanced HCC who are not eligible for locoregional therapies like Transarterial Radioembolization (TARE) or Transarterial Chemoembolization (TACE).[3] Tumor lysis syndrome, typically occurring shortly after the initiation of chemotherapy, is caused by the rapid breakdown of malignant cells, leading to the release of intracellular contents into the bloodstream. While TLS is more prevalent in hematological malignancies, it can also occur in solid tumors, albeit rarely.[4]

Tumor Lysis Syndrome (TLS) is indeed a critical condition that can arise during the treatment of malignancies, although it is more commonly associated with hematologic cancers like leukemia and lymphoma. In patients with solid tumors, TLS is less frequent but can still occur, particularly in cases of aggressive tumors or when there's a rapid response to treatment.[5]

In the presented case, TLS manifested within one week of starting Sorafenib, a relatively short interval. This underscores the potential for TLS to occur even in patients with substantial tumor burdens undergoing Sorafenib therapy. Awareness of this possibility is crucial for timely diagnosis and intervention.

CONCLUSION

Clinicians should be alert to the risk of Tumor Lysis Syndrome (TLS) in patients with Hepatocellular Carcinoma (HCC) who are receiving Sorafenib treatment, especially in those with significant tumor burdens. Early detection and management of TLS are crucial for enhancing patient outcomes in these cases.

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CONFLICT OF INTEREST

The authors report no conflicts of interest associated with this study. There were no financial interests or affiliations that could affect the findings or conclusions of this case report.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Ethical Committee of Ankara Bilkent City Hospital. Written informed consent was provided by the patient's family for the publication of the case details.

ABBREVIATIONS

HCC: Hepatocellular Carcinoma; **TLS:** Tumor Lysis Syndrome; **ER:** Emergency Room; **AST:** Aspartate Aminotransferase; **ALT:** Alanine Aminotransferase; **BUN:** Blood Urea Nitrogen; **ICU:** Intensive Care Unit; **TARE:** Transarterial Radioembolization; **TACE:** Transarterial Chemoembolization.

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