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Management of Tumor Lysis Syndrome in Patients With Multiple Myeloma During Bortezomib Treatment

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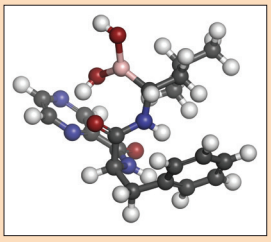

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Background: Tumor lysis syndrome (TLS) is a severe, life-threatening complication that typically occurs in highly proliferative malignancies. Although TLS is unusual in multiple myeloma (MM), it is still associated with significant morbidity. Bortezomib has been widely used for the treatment of MM with encouraging results, but TLS seems to occur more frequently in patients with MM receiving bortezomib than in patients receiving other conventional agents.

Objectives: The purpose of this article is to present and examine several significant risk factors for the development of TLS, based on the results of a study involving patients with MM who developed TLS during bortezomib treatment.

Methods: Patients with MM were treated with bortezomib-containing regimens.

Findings: The early identification and intervention of high-risk patients with MM is imperative. Timely and efficient management could decrease TLS incidence rates and improve the efficacy of treatment outcomes.

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One result of the rapid destruction of malignant cells and the abrupt release of intracellular ions, nucleic acids, and proteins and their metabolites into the extracellular space, tumor lysis syndrome (TLS) encompasses the metabolic changes that occur with tumor breakdown after the initiation of cytotoxic therapy (Cairo & Bishop, 2004). TLS is a collection of metabolic abnormalities, including increased lactate dehydrogenase (LDH), hyperuricemia, hyperphosphatemia, hyperkalemia, hypocalcemia, and renal failure. These metabolic complications predispose patients with cancer to various clinical toxicities, including renal insufficiency, cardiac arrhythmias, seizures, neurologic complications, and, potentially, sudden death (Cairo & Bishop, 2004; Mathisen, 2011). Multiple myeloma (MM) is a clonal neoplasm affecting terminally differentiated B cells and has been traditionally viewed as a hypoproliferative disease of plasma cells (Kyle & Rajkumar, 2004). Therefore, TLS is thought to only rarely complicate the treatment of patients with MM, usually following high-dose chemotherapy or autologous stem cell transplantation (Fassas et al., 1999). Bortezomib is a potent and reversible proteasome inhibitor that has significant antimyeloma activity in vitro and in vivo (Sezer et al., 2006). With the widespread use of bortezomib in relapsed and refractory MM, as well as in newly diagnosed MM, the incidence of TLS in patients with MM is increasing (Furtado & Rule, 2008; Sezer et al., 2006; Terpos, Politou, & Rahemtulla, 2004). This article describes five patients with MM who developed TLS during bortezomib treatment.

Case Report

From January to October 2013, 121 patients with MM were treated with bortezomib-containing regimens at Beijing Chao-Yang Hospital, which is affiliated with Capital Medical University in China. Of those patients, five developed TLS; three were women, and two were men. The median age of the five patients