Carfilzomib: A Next-Generation Proteasome Inhibitor for Multiple Myeloma Treatment

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Although the incidence of multiple myeloma (MM) is increasing, the median overall survival and the number of agents in the pipeline for treating MM also are increasing. Response rates higher than 80% are not uncommon in the frontline setting when the novel agents thalidomide, lenalidomide, and bortezomib are used in combination. Response rates and survival also have improved in disease that has relapsed after treatment with conventional therapies. The focus of research has now shifted to improving survival and disease response in patients refractory to current treatment paradigms. New agents are targeting new pathways, as well as existing mechanisms known to be effective, but with different safety profiles. Carfilzomib is a potent, selective, irreversible inhibitor of the ubiquitin-proteasome pathway. The drug is a next-generation proteasome inhibitor found to be safe and effective for patients with relapsed and refractory MM, where treatment options are limited. As with any newly approved agent, one should recognize that drugs within the same class will be administered differently and often cause dissimilar treatment-related toxicities. Oncology nurses are crucial to the successful administration of chemotherapeutic agents such as carfilzomib, and an understanding of management techniques is paramount to quality patient care.

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Background

The activity of bortezomib has confirmed the proteasome as an important therapeutic target in MM. Proteasome inhibition leads to accumulation of ubiquitinated (the process by which a protein is tagged with ubiquitin for transport to the proteasome for degradation) proteins, inhibition of myeloma cell proliferation, and induction of apoptosis (Moreau et al., 2012). Carfilzomib (Kyprolis™) is a selective, irreversible proteasome inhibitor...