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Commentary

Beneficial Impacts of Induction Therapy and Stem Cell Mobilization on Patients Diagnosed with Multiple Myeloma

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DESCRIPTION

Based on the higher Complete Response (CR), Longer Overall Survival (OS), and fewer side effects compared with conventional chemotherapy in several randomised studies, high-dose chemotherapy followed by Autologous Stem Cell Transplant (ASCT) has been regarded as the standard of care for younger patients with newly diagnosed MM for the past ten years. Before collecting peripheral blood stem cells, patients who are suitable for early ASCT often undergo a small number of rounds of induction treatment to decrease tumour cell bulk and bone marrow plasma cell infiltration. Novel medicines that impact higher rates of CR are now accessible in comparison to the standard therapies that were formerly employed. One of the best indicators of long-term results is the attainment of CR following both induction therapy and ASCT, which, in younger patients, coupled with maintenance of a durable CR, is a primary objective of the therapeutic plan. The major function of enhanced angiogenesis in MM bone marrow was first thought to be the justification for the use of Immunomodulatory Drugs (IMiDs) in MM due to their recognised antiangiogenic effect.

More research has revealed that in addition to their direct impact on MM Plasma Cells (PCs), thalidomide and lenalidomide also prevent MM cells from adhering to bone marrow stromal cells and prevent the release of growth factors, survival factors, and angiogenic cytokines (IL-6, TNF-alpha, VEGF, and FGF-2) that are stimulated by the interaction of tumour cells with their microscopic environment. These substances also considerably alter the host immune response by increasing the quantity and functionality of NK cells, strengthening Dendritic Cell (DC) functionality, and boosting T-cell activity by delivering T-cell costimulatory signals *via* B7/CD28 pathways. With the identification of its antitumoral mechanisms the blockage of NF-B activation and the IL-6 paracrine loop-bortezomib is the first proteasome inhibitor utilised in clinical practise in Multiple Myeloma (MM). Following this, it was shown that Bortezomib acts directly on PCs to cause apoptosis through the activation of both caspases 8 and 9, overcomes the protective effect of IL-6, and works in concert with Dexamethasone. The action of bortezomib on the bone marrow microenvironment is similar to that of IMiDs in that it inhibits the binding of PCs to stromal cells, the release of growth factors, and myeloma-associated neoangiogenesis. In order to establish a speedy and sustained haematological recovery following high-dose treatment, CD34+ cell mobilisation aims to gather an adequate number of cells.

This is because a delayed hematopoietic recovery is associated with greater toxicity and transplant-related mortality. Deep vein thrombosis and associated pulmonary embolism, neutropenia and thrombocytopenia, peripheral neuropathy, tiredness, and constipation are typical adverse effects of IMiDs. Instead, thrombocytopenia and peripheral neuropathy are the major causes of bortezomib toxicity. Fatigue and diarrhoea are also reported. The primary reason why Ventricular Assist Device (VAD) increased mortality was systemic infections.

CONCLUSION

In the current study, it can be confirmed that, at this time, it is not possible to strongly recommend a specific upfront induction regimen for ASCT; instead, single myeloma patients' medical histories and comorbidities should be taken into account when choosing an induction regimen because each one has advantages and disadvantages. Nevertheless, compared to previous therapies based on conventional agents, innovative antimyeloma medications, primarily bortezomib and lenalidomide-based regimens, offer a greater proportion of Overall Response Rate (ORR) and CR/nCR rate.

It should be noted that achieving CR following both induction therapy and ASCT is one of the best indicators of long-term success and serves as a key benchmark for current treatment approaches that include autotransplantation upfront. Bortezomib-containing relationships among new drugs provide a superior ORR, toxicity profile, and a higher likelihood of collecting the minimal target of CD34+.

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