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A Double Observational Studies Research on the Advantages of Plerixafor for Mobilising Peripheral Blood Stem Cells before Autologous Transplantation

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Abstract

Hematopoietic stem cells must be propelled from the bone marrow to the peripheral circulation for collecting prior to autologous stem cell transplantation (ASCT). Plerixafor, an antagonist of C-X-C chemokine receptor type 4, is employed to boost stem cell harvests. Plerixafor's impact on post-ASCT results, however, is still unknown.

Keywords: Hematopoietic stem cells; Mobilising peripheral blood stem cells; Autologous transplantation

Introduction

Multiple myeloma and non-Hodgkin lymphoma can be effectively treated with autologous stem cell transplantation (ASCTHSCs (hematopoietic stem cells) must be stimulated to travel from the bone marrow to the peripheral circulation (i.e., mobilised) before harvesting because the peripheral blood only contains a small number of HSCs. Granulocyte colony-stimulating factor (G-CSF), either alone or in conjunction with chemotherapy, is the traditional method of mobilising HSCs [1,2]. However, it can occasionally be challenging to harvest enough HSCs, particularly in patients who have undergone many lines of therapy.

Methods

Plerixafor mobilisation has grown in popularity recently. Plerixafor and G-CSF together have been proven to boost the number of HSCs per harvest in comparison to each drug used alone, making them an advantageous combination for patients who have had a number of treatment cycles or exposure to myelotoxic chemicals. Plerixafor, according to certain medical professionals, raises the possibility of malignant cells contaminating the apheresis product. Plerixafor appears to improve post-ASCT results, according to a number of recent studies [3, 4]; nevertheless, more research is required. The purpose of this study was to assess plerixafor's impact on post-ASCT outcomes in Japanese patients with haematological malignancies using a dual-center retrospective cohort design.

From September 2014 to February 2022, records of adult non-Hodgkin lymphoma or multiple myeloma patients who underwent autologous stem cell harvest (ASCH) and ASCT at Shinko Hospital in Kobe or Kyoto University Hospital in Kyoto were examined. Plerixafor is not administered to patients at the authors' institutions whose Day-1 PB-CD34+ cell count is less than 20 cells/L. Because of this, the authors only included patients with a Day-1 PB-CD34+ cell count of 20 or less cells/L [5, 6].

Plerixafor and G-CSF can be utilised to move HSCs out of the bone marrow and into the peripheral circulation before ASCH. The best methods for HSC mobilisation have been the subject of numerous investigations, and the therapeutic requirements for employing plerixafor have been steadily clarified. Nonetheless, some medical professionals think that plerixafor raises the danger [7, 8].

Discussion

By using univariate (neutrophil, P = 0.004, platelet, P = 0.002), subgroup, propensity score matching, and inverse probability weighting analyses, it was determined that the time to neutrophil and platelet engraftment was considerably reduced with plerixafor compared to without plerixafor. Although there was no significant difference in the cumulative incidence of fever with or without plerixafor (P = 0.31), there was a significant difference in the cumulative incidence of sepsis (P 0.01). Accordingly, the results at hand show that plerixafor promotes early neutrophil and platelet engraftment while also lowering the risk of infection [9, 10].

Conclusions

The researchers discovered that plerixafor shortens hospital stays and reduces infection risk by hastening neutrophil and platelet engraftment. The authors draw the following conclusion: Plerixafor may be safe to use and may lower infection risk in patients with low Day-1 PB-CD34+.

Acknowledgement

None.

Conflict of Interest

None.

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