Blinatumomab As Upfront Consolidation Therapy in an Adult Patient with High-Risk Precursor B-Cell Acute Lymphoblastic Leukemia: A Case Report

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Background

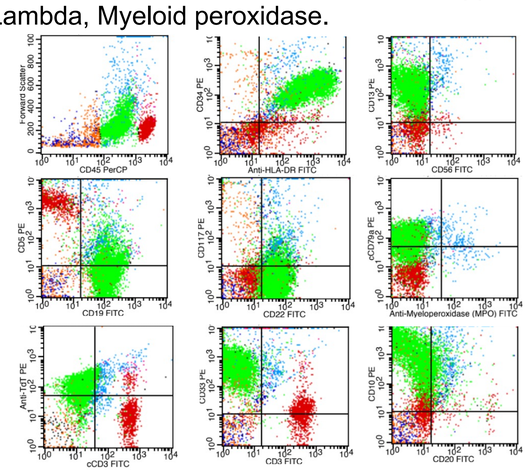
- Acute lymphoblastic leukemia (ALL) is a malignant proliferation of lymphoid progenitor cells.
- Older patients have poorer prognosis and outcomes than adolescents and young adults (AYA) due to increasing frequency of medical comorbidities and lower functional status (5-year overall survival of 20% for patients ≥ 60-year-old versus 80-85% in AYA).
- High-risk features are usually observed in adult population leaving us with limited treatment options.
- Blinatumomab is a CD3/CD19 bispecific T-cell engager enabling T-cell cytotoxicity against $CD19^+$ B cells. It has demonstrated efficacy in relapsed/refractory Ph-positive and Ph-negative ALL however with limited data on use as consolidation treatment.

Aim

- We report feasibility, tolerability and outcome of a high-risk Philadelphia chromosome-negative precursor B-cell ALL (Ph-negative precursor B-ALL) patient who received blinatumomab as upfront consolidation therapy.

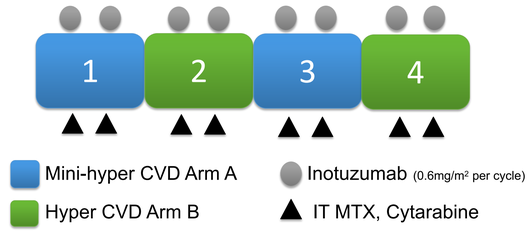
Clinical Case

- A 62-year-old Filipino male with known hypertension, type 2 diabetes mellitus and osteoarthritis initially scheduled for total knee replacement was deferred due to peripheral blood findings of white blood cells 3.1 x 10^9/L, 70% lymphocytes, 26% neutrophils on differentials, hemoglobin 125g/L and platelets 209 x 10^9/L.
- Bone marrow (BM) showed several small to medium-sized blasts with ovoid to slightly irregular nuclei, dense slightly coarse chromatin, absent to few inconspicuous nucleoli, and scanty cytoplasm, with few medium- to large-sized blasts with ovoid to slightly irregular nuclei, fine to slightly coarse chromatin, few conspicuous nucleoli, and scanty to moderately abundant cytoplasm compatible with B-lymphoblastic Leukemia with aberrant myeloid antigen expression.
- The karyotype was 46, XY, del (20) (q11.2). Ph like chromosome was negative
- Fluorescence in situ hybridization (FISH) showed BCR::ABL1 fusion gene (3.42%)
- Flow Cytometry revealed 74.09% of blasts, which were moderately bright for CD45, CD34, CD13, CD19, CD22, B lymphoid cCD79a and TdT, bright for HLA- DR, CD33 and CD10, dim for CD11c, CD14, CD41 and CD71 and negative for CD20, CD117, CD3, CD4, CD5, CD8, CD56, Kappa, Lambda, Myeloid peroxidase.

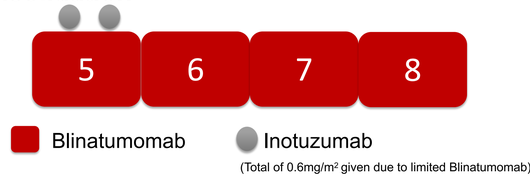


Summary of Treatment

Induction



Consolidation



Maintenance

24 months

POMP (Prednisone, Vincristine, Methotrexate, and 6-mercaptopurine)

- After induction, hematologic remission and flow cytometry with 10^{-4} sensitivity of BM showed MRD negativity.
- Grade 1 cytokine release syndrome (low-grade fever and headache) was observed during the first cycle of Blinatumomab.
- The patient has remained in remission by MRD post consolidation and maintained on POMP therapy.

Conclusion

- Induction chemotherapy followed by upfront consolidation immunotherapy with blinatumomab revealed favorable outcomes hence effective in the management of elderly patient with Ph-negative precursor B-ALL.
- With its safety profile, favorable tolerance and high MRD response rate as targeted immunotherapy, blinatumomab is currently taking the lead in the paradigm for treating ALL.

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