

# Salvage of Chemo-Refractory Acute Leukemia by Allogeneic Stem Cell Transplantation

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**Background:** Chemotherapy-refractory acute leukemia is only salvaged by allogeneic stem cell transplantation (ASCT). However, not much is known about the characteristics of patient subset which can be salvaged by ASCT.

**Aim:** In this study, we intended to analyze clinical outcome of patients with acute leukemia who received ASCT in chemo-refractory state. With this analysis, we tried to find subset who could be salvaged by ASCT.

**Methods:** We retrospectively analyzed patients who received ASCT for chemo-refractory acute leukemia. We included patients who received ASCT while the disease was not in complete remission (CR). Type of ASCT, source of stem cell, conditioning regimen, development of graft-versus-host-disease (GVHD), overall survival (OS) were obtained.

**Results:** A total of 226 patients were analyzed. Disease included acute myeloid leukemia (AML, N = 156), acute lymphocytic leukemia (ALL, N = 52), and acute biphenotypic leukemia (ABL, N = 18). Proportion of secondary leukemia was 15.9%. 41.6% of patients were primary chemo-refractory, while 58.4% of patients developed chemo-refractoriness after achievement of CR at least once. CR was achieved in 79.6% of patients by ASCT. CR rate seemed to be higher in AML (84%) compared to ALL (71%) or ABL (67%) ( $p = 0.058$ ). OS was significantly superior in patients with AML or ABL compared to ALL ( $p = 0.020$ ). Five-years OS rate was more than 20% in patients with AML or ABL, while 5-years OS rate was less than 5% in patients with ALL. Patients who received sibling ASCT had better survival outcome compared to unrelated ASCT or haploidentical ASCT ( $p < 0.001$ ). Stem cell source ( $p = 0.335$ ) or primary chemo-refractoriness ( $p = 0.284$ ) did not affect survival outcome. Conditioning intensity did not affect survival outcome also ( $p = 0.404$ ). Interestingly, karyotypic risk grouping had prognostic value in these patients with shorter OS observed in patients with poor risk group compared to standard or good risk group ( $p = 0.006$ ).

**Conclusion:** Among acute leukemia's, only AML and ABL are salvaged by ASCT when they are chemo-refractory. However, outcome of primary chemo-refractory disease is not inferior, hence ASCT should be considered in this disease. For ASCT in chemo-refractory acute leukemia, sibling ASCT has better outcome than unrelated ASCT.