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### **Autologous Immune Enhancement Therapy (AIET) for a Case of Acute Myeloid Leukemia (AML) - Our Experience**

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#### **Background:**

Hematological malignancies such as AML conventionally require Bone Marrow transplantation, failing which Umbilical cord blood transplantation have been reported in a few cases. We have come across a patient in whom both the options were not feasible due non-availability of a matching donor or donor unit of umbilical cord blood in whom the AIET along with chemotherapy has been administered and we report herewith the early results.

#### **Materials and methods:**

An 8-year-old girl was evaluated for fever of 2 weeks duration in November 2005. Blood investigations revealed anemia with leucocytosis with the presence of blasts with Auer rods. A bone marrow examination confirmed a diagnosis of acute myeloid leukemia-M1. She was started on induction chemotherapy with the pediatric BFM-AML 93 protocol. In the post-induction chemotherapy period, the bone marrow was in remission. Since she did not have a sibling for a bone marrow transplant or fully or partially

matching homologous umbilical cord blood unit, she was considered for AIET. In the first sitting cells were harvested from the bone marrow and cultured and re-infused to the patient after 3 weeks. The first cell dose was  $2.0 \times 10^8$  cells. During this period she received her consolidation chemotherapy. Subsequently cells were harvested from the peripheral blood prior to each cycle of chemotherapy and re-infused after 2-3 weeks. The subsequent cell doses were  $7.5 \times 10^7$  cells,  $2 \times 10^6$  cells, and  $6.3 \times 10^8$  cells. The procedure followed was as per Terunuma et al., reported earlier and was aimed at expanding lymphocytes and activating them as well as expanding Natural Killer cells (NK) in vitro. Documentation of the cell count were done before and after expansion by Immuno-Pheno Typing and LAL endotoxin tests were done before every transfusion.

#### **Results:**

IP typing showed a reasonably good expansion and activation of lymphocytes at all four expansions, but NK cell expansion was good only during the first and fourth transfusions. The quantity of MNCs harvested

and their expansion in general was good after the first and fourth time compared to the 2<sup>nd</sup> and 3<sup>rd</sup> time. The patient had no adverse reaction during any of the AIET transfusions. Currently the patient is on maintenance chemotherapy with normal blood counts. The body weight before the starting of the first chemotherapy was 17.2 Kgs and now its 21.0 Kgs.

**Conclusion:**

Autologous Immune Enhancement Therapy for the case mentioned above has been accomplished for the first time in India (as far our knowledge is concerned), and has had no side effects per se because of the transfusion. A longer follow-up of the same patient and administration of the AIET to several more patients of the same condition has to be done for further authentication.

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