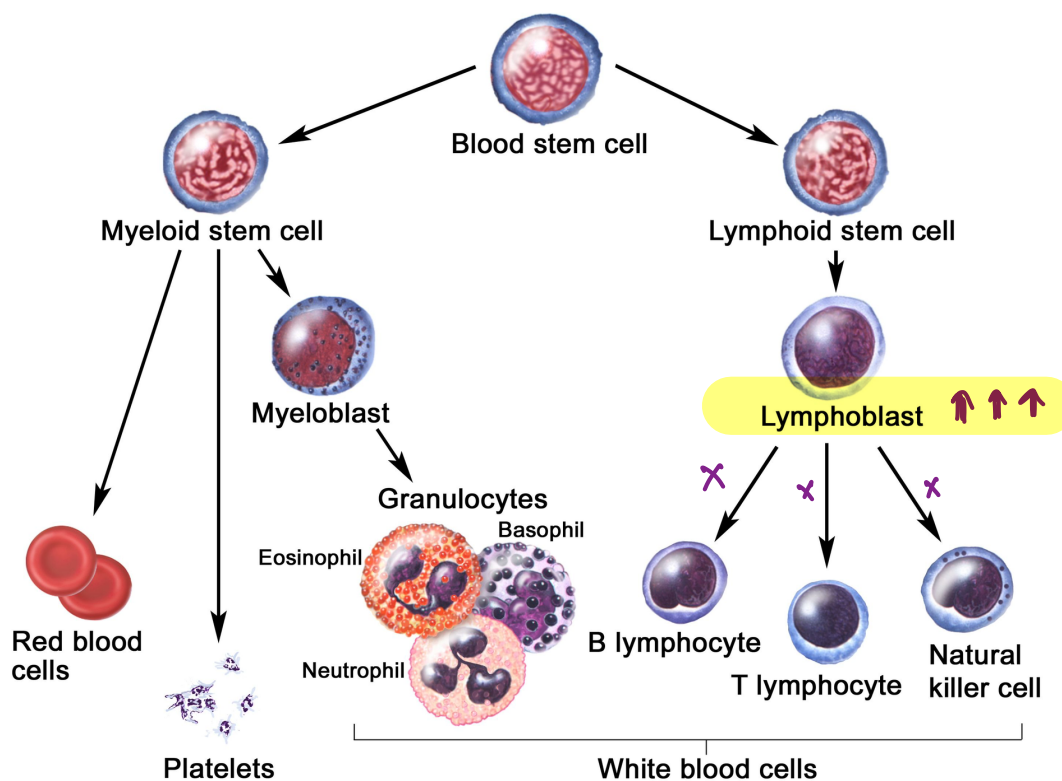


Acute Lymphoblastic Leukaemia



- Neoplastic accumulation of lymphoblasts (>20%) in the bone marrow.
- Commonest tumor, leukaemia in children.
- Lymphoblasts are characterised by positive Nuclear staining for TdT, a DNA polymerase.

Pathogenesis :

- Subclassified into B-ALL & T-ALL based on surface markers.
 - B-ALL (m/c) - 76%
 - ↓
 - CD10, CD19 and CD20
 - T-ALL ⇒ CD2 to CD8 (Do Not express CD10)
- * CD10 - Associated with Philadelphia chromosome t(9:22).

Etiology :

- (i) Chemoradiation → DNA Mutation.
- (ii) Genetic Disorder - (a) Down Syndrome (Trisomy 21)
(AML + ALL)
(b) Translocation - t(12:21)
t(9:22)
t(1:19)
t(4:11)
- (iii) Infection = HTLV-1
- (iv) Klinefelter Syndrome
- (v) NF1
- (vi) Fanconi's anaemia.

Effects of ↑ Lymphoblasts in Bone marrow:

- (i) ↑ Lymphoblast → ↓↓ WBC (functional) → Infection.
- (ii) ↓ RBC → Anaemia (Pallor, Dyspnoea)
↓ Platelets → Thrombocytopenia (Bruising, Bleeding)
- (iii) ↑ Lymphoblast → Bone marrow → Bone pain.
expansion

Clinical Presentation:

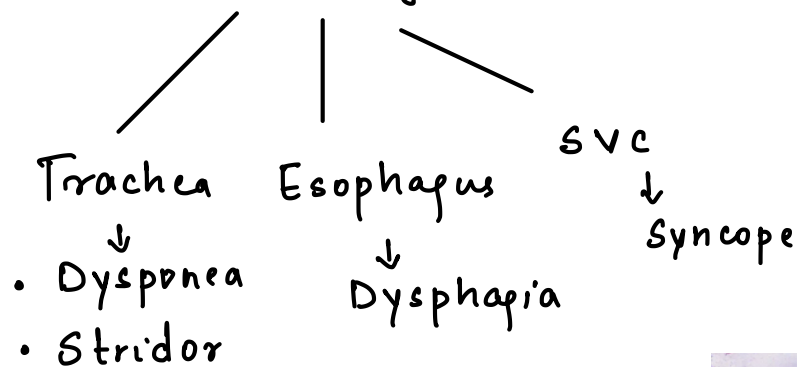
- (i) Pallor, anaemia
- (ii) Bleeding (Epistaxis)
- (iii) Infection (Recurrent Pneumonia)
- (iv) Bone pain
- (v) Hepatosplenomegaly

(vi) Lymphadenopathy

(vii) CNS leukaemia - Raised ICP
Vomiting
6th Nerve palsy.

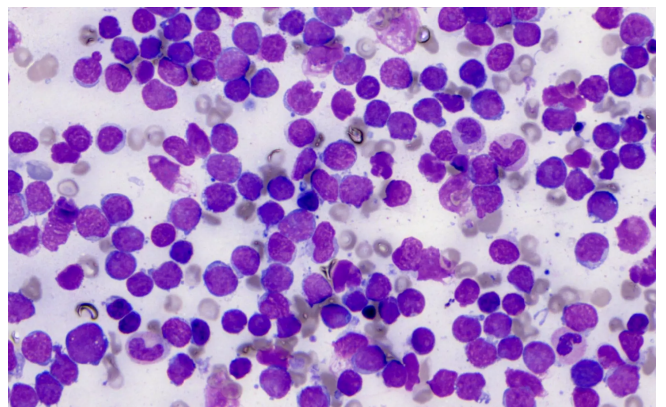
(viii) Testicular Enlargement

(ix) Thymus enlargement



Diagnosis:

- (1) CBC :
- (a) Hb ↓
 - (b) RBC ↓
 - (c) Platelets ↓
 - (d) TLC can be Normal / ↓ / ↑
 - (e) PBS =  → ↑ lymphoblasts



(2) Bone marrow biopsy : (Definitive)

- Salah & Klima Needles are used.
- Site = Post. Sup. Iliac spine
- Blasts > 20%.

(3) Immunophenotyping : Lymphoblast - TdT (+)
MPO (-)

- Flow cytometry for CD markers

(4) Genetic Studies : Cytogenetics & PCR

(5) Test for Leukemic Infiltration:

- (a) CNS - CT/MRI & LP
- (b) Thymus - CT Chest
- (c) Testis - USG

Treatment:

- Goal: Complete Molecular Remission.

Systemic Chemotherapy



- (a) Cyclophosphamide
- (b) Vincristine
- (c) Daunorubicin
- (d) Prednisolone

Intrathecal Chemotherapy



- Prophylactic Treatment
 - (1) Chemotherapy (MTX, Cytarabine)
 - (2) ± Cranial Radiation

[Induction → Consolidation → Maintenance]

Advance Treatment



- (1) Tyrosine Kinase Inhibitor (Imatinib)



for t(9:22)

- (2) Bone marrow transplant

Tumor Lysis Syndrome: (complication)



$\text{PO}_4^{3-} \uparrow$

$\text{K}^+ \uparrow$



Uric Acid $\uparrow$

→ Acute Kidney Injury

Tx = (1) IV Fluid
(2) Allopurinol
(3) Rasburicase.