Welcome to CPD

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Acute Leukemia

Acute leukemia is characterized by malignant, clonal, proliferation of white blood cell precursors (blast cells) which occupy and inhibit the function of the bone marrow.

It is the commonest malignancy in childhood (other malignant are CNS tumour, lymphoma, neuroblstoma, Wilms' tumour)

Classification of acute leukemia

- Acute Lymphoblastic Leukemia

  L_1, L_2 and L_3
- Acute Myeloblastic Leukemia

  M1- AML without maturation

  M2- AML with maturation

  M3- Acute promyelocytic

  M4- Acute myelomonocytic

  M5- Acute monocytic leukemia

  M6- Erythroleukemia

  M7- Megakaryocytic leukemia

Epidemiology

Incidence: 1:25000 population upto 14 years age.

Peak age: 2-6 years.

Sex: boys are more prone

Risk is 100% in monochorionic twin if one has disease.

Risk is double to second twin regardless of zygotes.

Patients of Down syndrome are 14 times more prone.

ALL-85% and AML-15%

Etiology

In all age group etiology is unknown.

Genetic factors	Environmental factors
Down syndrome	Ionizing radiation
Bloom syndrome	Benzene
Fanconi syndrome	Nitrosourea
Ataxia telangiectasia	Alkylating agent
Turner syndrome	Drugs
Neurofibromatosis	Advance maternal age
PNH	Virus: EB virus.

Clinical Features of acute leukemia

Symptoms:

Fever,

Anorexia, lethargy,

Spontaneous bleeding,

Bone and joint pain,skin rashes,

Gum swelling,

Headache, vomiting, double vision

Clinical Features (contd.)

Signs:

Pallor,

Petechiae, purpura, echymoses, Epistaxis,
Bony tenderness,

Gum hypertrophy, proptosis,
Lymphadenopathy,

Bacteria or herpes or/and candida infections,
Papilloedema, cranial nerve palsy,

Superior vena caval obstruction

Differential diagnosis

1. Aplastic anaenia
2. ITP
3. Malignant disease which infiltrate bone marrow
4. Transient erythroblastic anaemia
5. Myelofibrosis

Investigations

- Blood count
- Peripheral blood film
- Urine routine exam
- Chest skiagram
- LFT
- Renal function test
- Uric acid level
- CSF study
- Bone marrow analysis

Treatment of ALL

Principle of therapy:

- Specific therapy
- Supportive therapy

Treatment (contd)

Specific therapy:

80% by drugs and 20% by bone marrow transplant (high risk group).

Treatment (contd)

Risk determination:

Standard risk	High risk
• Age : 2-9 years	<1yr & >10yrs
• No organic involvement	organic involvement
• WBC: <1 lac	>1 lac
• Blast cells: <50%	>50%
• Pre, Early pre B, T cell	B cell type
• FAB- L_1	L_2, L_3
• Hyperdiploidy	Hypodiploidy

Treatment (contd)

Specific drugs therapy-

1. Induction remission
2. Consolidation/ Intensification (Early when given before CNS directed therapy or late when given after CNS directed therapy)

3 CNS directed therapy

4. Maintenance

Treatment, Specific drugs therapy (contd)

Induction remission: To achieve resolution of clinical features. To achieve BM remission.

Duration of therapy 4-6 weeks.

Prednisolone, Vincristine, Antracycline (Daunorubicin or Adriamycin), L-asparaginase, MTX and Hydrocortisone+ Cytosine arabinocide and Etoposide for high risk group.

Allopurinol should be started 24 hours before commencing the therapy.

Specific drugs therapy (contd)

- Consolidation/ Intensification: To prolong remission and reduce incidence of extramedullary disease. If WBC count >50,000/cmm then early intensification should be done. Vincristine, Anthracycline, L-asperginase, Cytocine arabinocide, Etopocide and thioguanine are used for 6 days

Specific drugs therapy (contd)

CNS directed therapy: To eradicate leukemic cells within CNS which are not damaged by systemic therapy. Three types of CNS prophylaxis are used.

a) Intrathecal drugs only: MTX and Hydrocortisone for standard risk group.

b) IV high dose MTX (6gm/sq.m over two days) for intermediate risk group.

CNS directed therapy (contd)

c) Cranial eradiation 2000 rad for high risk group. Indications are;

-patient who present CNS symptoms at diagnosis.

-who has WBC count > 1lac at diagnosis.

- If CNS involvement present at diagnosis then CNS directed therapy should be given earlier than intensification.

Specific drugs therapy (contd)

Maintenance therapy:

- 6-Mercaptopurine- daily
- MTX - weekly
- Vincristine - monthly
- Prednisolone - monthly 5 days.

Cotrimoxazole should be started a week after starting the induction remission therapy.

Maintenance should be given at least 1½ year but no value over 3 years

Bone marrow transplantation

Indications:

1. High risk leukemia patient, to have BMT just after first induction remission.
2. Mature B-cell type.
3. If DNA index <1:16
4. If tree is no initial response.
5. If relapse occurs within first year during treatment.
6. Some cytogenetic changes; t 9,22 and t4,14

Supportive care

- Transfusion of blood component.
- Prevention of infection by antibiotics. Fever lasting for one hour or more with neutropenia indicate septicemia unless proved otherwise.
- Proper nutrition support.
- Vaccination- HBV vaccine double dose adopting rapid immunization schedule (0, 1, 2 mo and 1 year). No live vaccine can be given.
- Continuous psychological support to the patient and parent.

Follow up

- During therapy :Daily.
- During maintenance : Monthly
- During off therapy:
  - -1st year: every 3 month
  - -2nd year: every 6 month
  - -Thereafter: yearly follow up.

Down syndrome with leukemia

- 14 times more frequent in child with DS than in general population.
- Ratio of ALL to AML is same.
- ALL with DS outcome is same as general population.
- AML with DS much better outcome. More than 80% long term survival rate than nonDown syndrome.
- After induction less intensive therapy require to achieve the better result. general population general population

DS with leukemia (contd)

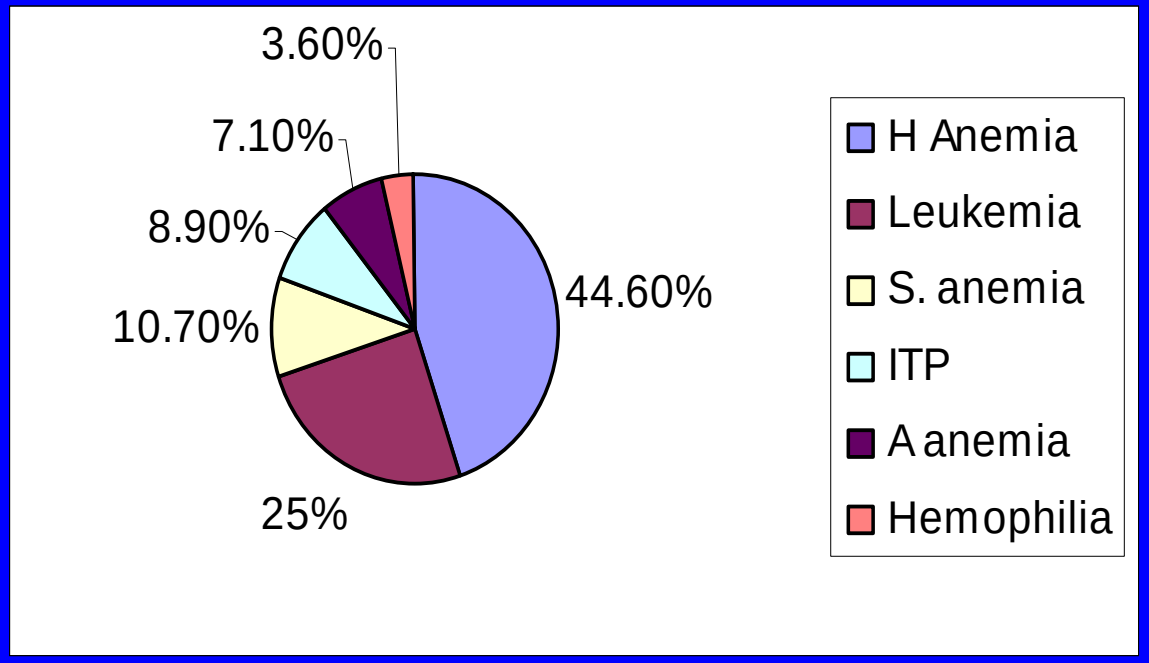
- Neonate with DS are prone to develop a transient leukemia majority which resolve spontaneously within a few days or weeks, does require chemotherapy but may require transfusion support.
- 20-30% transient leukemia may turn to typical leukemia, so regular follow up should be done for first few year of life. Down syndrome with leukemia

Hematological cases at ICMH from 99- 02.

- Total admitted patient in paediatric general ward- 6103.
- Total hematological cases- 56 (0.91%)

Total hematological cases- 56

- Hemolytic anemia:25
- Leukemia: 14
- Severe anemia: 6
- ITP: 5
- Aplastic anemia: 4
- Hemophilia: 2



Thank You