Lymphoma

Objective

1-What is the classification of lymphoma .

2-How the child with each type of lymphoma present to us .

3-What is the most important investigations for diagnosis and differentiate from other disease.

4-Treatment.

Lymphoma can be classified into

1- Hodgkin`s lymphoma (HL)

2- Non – Hodgkin`s lymphoma (NHL)

Non – Hodgkin`s lymphoma (NHL)

The classification system of choice worldwide is the world Health organization (WHO) and expansion of the Revised European – American lymphoma (REAL)

A- B cell type

*** Precursor B- lymphoblastic**

Leukaemia / lymphoma

Mature (peripheral) B-cell neoplasm

- Diffuse large B-cell lymphoma

- Follicular lymphoma
- Burkitt lymphoma
- [Mantle cell]

B- T-Cell and natural killer neoplasms

** Precursor T- lympoblastic*

- Leukaemia / lymphoma
- Mature (peripheral) T-cell neoplasm

** Anaplastic large-cell lymphoma*

- - T-NHL cell, primary systemic type
- - [Anaplastic large cell lymphoma
- - T-NHL cell, primary cutaneous type]

** [Mycosis fungoides]*

** [Peripheral T-cell, not otherwise characterized*

Epidemiology

- In developed countries NHL represent 60-70% of all childhood lymphoma .
- Affecting children mainly between 7-10 years of age.
- The male: female value was 2.5
- Increased incidence in children with inherited or acquired immunodeficiencies (AIDS) are clinically aggressive
- Sensitivity to Epstein- Barr Virus (EBV) and the occurrence of malignant lymphoma → Burkitt type

Non – Hodgkin`s lymphoma (NHL)

Clinical manifestations

in children are largely determined by disease site and extent

1- the abdomen is the most common primary site (30-45%).

- Intussusception leading to the discovery of a small excisable tumor.
- large and rapidly growing abdominal distention, nausea, Vomiting, change in bowel habits.

2- Mediastinum tumors (25-35%) are typically T-cell lymphoblastic lymphomas, but in rare cases they can be large B-cell or Burkitt lymphomas.

- Mediastinal compression or cervical or axillary lymphadenopathy
- Chest X-ray show localized thymic mass often associated with pleural or pericardial effusions
- Patients risk of developing respiratory distress, worsened or provoked by general anesthesia
- Superior vena cave syndrome (swelling of arms, neck and face)

3- Other sites

The third most common site is Head & neck including waldeyer`s ring and the facial bones (10-20%), followed by the superficial lymph nodes (5-10%)

- Bone marrow involvement may cause anemia or thrombocytopenia

- CNS involvement → Headache, increased intracranial pressure or cranial nerve palsies.
- 5-10% includes tumours arise from less common sites such as bone, skin, thyroid, orbit, eyelid, kidney and epidural space.
- Bone lymphoma→ localized or generalized and associated with hypercalemia
- Kidney lymphoma → can be confused with nephroblastoma → tumor is bilateral, the infiltration multinodular or diffuse and renal failure is present
- Skin → subcutaneous lymphoma → occur in young children age < 2years

Diagnosis

- Physical examination
- Chest and nasopharyngeal X-ray .
- Abdominal ultrasound
- Bilateral bone marrow aspirations .
- CSF examination .
- Complete blood count.
- LDH, serum electrolytes, BUN, creatinine, uric acid levels.
- Bone scan and skeletal survey .
- Local CT scan (head and neck tumors)
- Magnetic resonance imaging (CNS disease)
- Abdominal CT scan
- Bone marrow biopsy in large-cell NHL

Staging

Stage I

- A single tumor (extranodal) or single anatomical area (nodal) with the exclusion of the mediastinum or abdomen .

Stage II

- Resected a single tumor (extranodal) with regional node involvement.
- Two or more nodal areas on the same side of the diaphragm.
- Two single (extranodal) tumours with or without regional node involvement on the same side of the diaphragm.
- A primary gastrointestinal tract tumor usually in the ileocecal area, with or without involvement of associated mesenteric nodes only.

Stage III

- Two single tumors (extranodal) on opposite sides of the diaphragm
- Two or more nodal areas above and below the diaphragm
- All the primary intrathoracic tumors (mediastinal, pleural, thymic)
- All extensive primary intra- abdominal disease, unresectable.
- All paraspinal or epidural tumors, regardless of other tumour site (s)

Stage IV

- Any of the above with initial CNS and / or bone marrow involvement.

Cytogenetics and molecular biology

- In Burkitt lymphoma tumour cell are characterized by a translocation of

T (8;14) (q24;q32) → the oncogene c-myc

T (2;8) (p12;q24) and

T (8;22) (q24;q11)

- in T-cell→ chromosomal abnormalities involve chromosome 14 or chromosome 7

Treatment

- Surgery
- Radiotherapy
- Chemotherapy

Hodgkin's disease

Etiology and epidemiology

1. 30 -40% of childhood lymphomas.
2. The incidence of which increases steadily throughout life.
3. Male : Female ratio of 2.7.
4. The true nature of Hodgkin`s disease may still be obscure → as a neoplasm of the lymphatic system → based on the presence of a putative malignant cell population (Reed-Sternberg cells).
5. Infection → poliovirus , Epstein – Barr virus(EBV) [The Reed – Sternberg cells harbour the EBV genome]
6. Socioeconomic → high socioeconomic small family → high risk for HD.
7. Cong. immunodeficiencies : ataxia telangiectasia wiskott – Aldrich syndrome and Blooms syndrome .
8. ↑ risk of developing the disease in parents and siblings of the same family → could indicate either environment or genetic influence

Clinical manifestations

1. Painless cervical lymphadenopathy is the most frequent presenting symptom in up 80% of children
2. Constitutional symptoms :-[No →A, one or more B]

- presence of unexplained fever
- Night sweats
- Unexplained lost of 10% or more of body weight in the 6months before admission

3- 60% mostly asymptomatic

4- Splenomegaly, hepatomegaly and symptoms relating to lung or pleural involvement

5- Mediastinum involvement.

Recommendations for diagnostic work- up of children with Hodgkin`s disease

1. **Mandatory procedures**

- Surgical biopsy reviewed by experienced pathologist .
- History with special attention to fever, sweating and weight loss .
- Physical examination with cytology or biopsy of doubtful nodes.
- Complete blood count and erythrocyte sedimentation rate.

- Chest X-ray (posteroanterior and lateral views).
- Lymphogram or CT scan in the younger child.

2- Procedures required under certain conditions

- Chest CT scan if med. hilar or pulmonary involvement is present
- Abdominal ultrasound or CT scan if lymphogram is equivocal or if the child has hepatomegaly or splenomegaly with normal lymphogram .
- Postnasal space X-ray if cervical nodes are involved .
- Bone marrow biopsy if systemic symptoms are associated with stage II-IV .
- Liver biopsy if hepatomegaly is homogenous.
- Radiolsotopie bone scan if stage IV.
- Pleural cytology if there is a pleural effusion.

3-Promising research procedures

- Positron emission tomography .
- Mediastinal magnetic resonance imaging .
- Interleukin -2 receptor and CD8 serum levels .

Staging

Stage 1

Involvement of a single lymph node region (1) or a single extralymphatic organ or site

Stage 11

Involvement of two or more lymph node regions on the same side of the diaphragm or solitary involvement of an extralymphatic organ or site and one or more lymph node regions on the same side of diaphragm

. Stage III

Involvement of two or more lymph node regions on the same side of the diaphragm or solitary involvement of an extralymphatic organ or site and one or more lymph node regions on the same side of diaphragm

Involvement of lymph node regions on both side of the diaphragm which may be accompanied by localized involvement of extralymphatic organ or site or by involvement of the spleen or both.

Stage IV

Diffuse or disseminated involvement of one or more extralymphatic organs or tissues with or without associated lymph node enlargement .

Treatment

- Radiotherapy.
- Chemotherapy