



Leukemia and Lymphoma Overview

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Slide 1

Topics

- Acute leukemias
 - Acute lymphocytic leukemia (ALL)
 - Acute myelogenous (granulocytic) leukemia (AML or AGL, rarely “ANLL”)
- Chronic leukemias
 - Chronic myelogenous (granulocytic) leukemia (CML, or CGL)
 - Chronic lymphocytic leukemia (CLL)
- Multiple myeloma (MM)

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Diagnostic Studies

- Peripheral blood
- Bone marrow
- Cytogenetics
- Flow cytometry
- Cytochemistry (special stains)
- Molecular markers
- For myeloma - SPEP, UPEP, Quantitative immunoglobulins, immunoelectrophoresis

Staging

- Most leukemias are not staged
- Chronic lymphocytic leukemia (CLL)
 - 5 Stages (Rai-Sawitsky) classification), 0 - IV
 - Based upon lymphocyte numbers, adenopathy, anemia, thrombocytopenia
- Multiple myeloma
 - 3 stages, based upon multiple factors: hemoglobin, M protein, calcium, bone lesions

Prognostic Factors

- Vary with leukemia type
 - AML
 - 7 subtypes, M1 through M7 (M3 especially important)
 - Cytogenetics
 - ALL
 - Cytogenetics
 - CGL
 - Stage: Chronic, accelerated, Blast crisis

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Treatment – Acute Leukemias

- Chemotherapy
 - Induction
 - Consolidation/re-induction
 - Maintenance
- Central nervous system prophylaxis-
intrathecal chemotherapy
- Supportive therapy
 - Growth factors

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Other Treatments – Acute Leukemias

- High dose chemotherapy with stem cell rescue-autologous or allogeneic
- Monoclonal antibodies – Mylotarg, etc.
- For acute promyelocytic leukemia (M3)-All-trans retinoic acid (ATRA)

Treatment – Chronic Leukemias

- CLL - chlorambucil, cyclophosphamide, prednisone, fludarabine, rituximab, Campath 1-H, now combinations
- CML - Hydroxyurea, α -interferon, Gleevec
- MM - alkeran/prednisone, thalidomide, dexamethasone, VAD (vincristine, adriamycin, dexamethasone), bortezomib, stem cell transplant

Response Assessment

- Complete (hematologic) response
- Partial response
- New categories of response: CR-platelet
- Relapse

Follow-up

- Blood counts
- Bone marrows
- Cytogenetics
- Other genetic markers
- Myeloma - SPEP, UPEP, bone x-rays,
– β 2 microglobulin



CALGB CRA Orientation Disease Modules Lymphomas

Two Major Types

- Hodgkin's Disease (HD)
- Non-Hodgkin Lymphomas (NHL)

Lymphoma Pathology

- Accurate diagnosis is key to good clinical trials and slide may be reviewed centrally to assure the correct diagnosis.
- Cytogenetics and molecular diagnostics may be needed to adequately diagnose a lymphoma.
- There are also benign conditions that mimic lymphomas.

Diagnostic Studies

- Lymph node biopsy
- Bone marrow aspiration and biopsy
- Flow cytometry
- Genetic studies
- Cytogenetics

Staging Studies

- Bone marrow aspiration and biopsy
- CTs
- Radionuclide scans: bone, Gallium, PET
- GI x-rays
- Spinal fluid analysis
- Others

Staging

- Same system for HD and NHL
- Four Stages
 - I: One lymph node group
 - II: Two lymph node groups
 - III: Nodes above and below diaphragm
 - IV: Organ involvement
- Add "A" for no systemic symptoms. "B" for systemic symptoms of documented fever, night sweats, weight loss, "E" for extranodal disease, "X" for bulky adenopathy

Prognostic Factors

- Stage - which factors in systemic symptoms, extranodal disease, and tumor bulk
- Histologic subtype
 - Hodgkin's Disease
 - Lymphocyte dominant
 - Nodular sclerosing
 - Mixed cellularity
 - Lymphocyte depletion

Prognostic Factors

- Stage - which factors in systemic symptoms, extranodal disease, and tumor bulk
- Histologic subtype
 - Non-Hodgkin Disease (up to 17 subtypes)
 - Follicular/diffuse
 - Cell type
 - Patterns

Prognostic Factors

- Histologic subtype
 - Non-Hodgkin Disease - many subtypes and variations
 - Low grade (indolent)
 - Intermediate grade
 - High grade (aggressive)

Treatment

- Chemotherapy
- Radiation therapy
- Monoclonal antibodies - with or without radiolabel or toxin
- High dose chemotherapy with stem cell rescue

Response Assessment

- Complete response
- Partial response
- Stable disease
- Progression/relapse

Special Considerations

- Leukemia <-> lymphoma?
- Transformation from one cell type to another
- Composite lymphomas
- HD - nodal distribution until disseminated
- NHL - frequently extranodal, and may be only extranodal

Follow-up

- Relapse (Progression free survival)
- Overall survival
- Toxicity (including second malignancies, fertility)
- Quality of life

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Slide 25

