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Leukaemia Section

Mini Review

Classification of T-Cell disorders

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Identity

Note

T-cell lymphoid disorders include a variety of disease entities which result from the clonal neoplastic expansion of an uncommitted (thymic) or a committed (post thymic) T-cell. Some of these diseases have distinct cytogenetic/molecular genetic features which allow to better define the various entities and understand their pathogenesis.

Clinics and pathology

Disease

T-prolymphocytic leukemia (T-PLL)
Variants: small cell and cerebriform cell.

Phenotype/cell stem origin

TdT-, CD1a-, CD4+ CD8-, CD4- CD8+, CD4+ CD8+,

Clinics

Aggressive course
Splenomegaly, high WBC with prolymphocytes.

Cytogenetics

inv(14)(q11q32), t(14;14)(q11;q32)
Xq28 abnormalities
idic(8)(p11), t(8;8)(p11;q1-2)
11q22-23 abnormalities
12p abnormalities
13q14.3 deletions

Genes

ATM gene (11q22-23) mutated. TCL1 (14q32.1) or MTCP1 (Xq28) activated.

Disease

Large granular lymphocyte leukemia (LGL) - T-cell Type.

Phenotype/cell stem origin

TdT-, CD1a, CD3+, CD2+, CD8+ CD4-, CD57+, CD16+/-Cytotoxic or suppressor activity.

Clinics

Indolent
Cytopenias, splenomegaly, lymphocytosis with granular lymphocytes.

Cytogenetics

Clonal abnormalities. In some cases, but no consistent specific abnormalities.

Genes

Clonality established by TCR rearrangements.

Disease

Large granular lymphocyte leukemia (LGL) - NK type.

Phenotype/cell stem origin

TdT-, CD1a, CD2+, CD56+, CD16+, CD7+/-CD3-, CD5-, TCR-Natural killer Activity.

Clinics

Aggressive or indolent
Lymphocytosis, splenomegaly, hepatomegaly.

Cytogenetics

del(6)(q21-25).

Genes

TCR chain genes in germ line.

Disease

Sezary syndrome (SS).

Phenotype/cell stem origin

TdT-, CD1a-, CD3+, CD4+, CD8-, Helper or no functional activity.

Clinics

Variable clinical course with skin involvement and cells with cerebriform nuclei.

Cytogenetics

Complex, clonal, oligoclonal or nonclonal with variable ploidy.
Abnormal.2p,
Abnormal.6q,
i(17q),
del(13)(q14)

Genes

P53 gene deletion and protein expression in the absence of gene mutation. Few cases express MDM2.

Disease

Adult T-cell leukemia lymphoma (ATLL).

Phenotype/cell stem origin

TdT-, CD1a-, CD7- CD4+ CD8- CD25+, Suppressor activity.

Clinics

Aggressive, Hypercalcaemia, lymphadenopathy, Œflower cells', HTLV-1 Positive.

Cytogenetics

Complex and often oligoclonal.
Numerical abnormalities: 3, 7, X.
Structural abnormalities: 1q, 3q, 6q, 14q.

Genes

Oligoclonal/mono clonal integration of HTLV-1in host DNA. Abnormalities of p53, p16 and p15 genes.

Disease

T-NHL hepatosplenic lymphoma.

Phenotype/cell stem origin

TdT-, CD1a-, CD3+/- CD56+, CD7+, granzyme A+, TCR g/d+

Clinics

Aggressive, Hepato splenomegaly

Cytogenetics

Abnormal.7q, i(7q)

Genes

TCR genes gamma/delta rearranged but alpha/beta not rearranged.

Disease

Peripheral/post-thymic T-cell lymphoma (pleomorphic and immunoblastic subtypes).

Phenotype/cell stem origin

TdT-, CD1a-, Variable expression of CD4 or CD8.

Clinics

Aggressive; advanced stages.

Cytogenetics

Variable.

Disease

Angio immunoblastic T-cell lymphoma.

Phenotype/cell stem origin

TdT-, CD1a-, CD2+, CD5+, CD3+ CD4+ CD8-.

Clinics

Disproteinemia, lymphadenopathy, immune abnormalities.

Cytogenetics

Complex with multiple related or unrelated clones.
+3 or i(3q), +5, del(6q). Progression from normal karyotype to abnormal clone observed during transition from hyperplasia to neoplasia.

Genes

Integrated EBV sequences present in both B-and T-cells and is unlikely to be the etiological agent.

Disease

Angiocentric (nasal) T-cell lymphoma.

Phenotype/cell stem origin

TdT-, CD1a-, T-cell or NK phenotype.

Clinics

Prevalent in Asia and south America; extra nodal involvement.

Cytogenetics

i(1q), del(6q), i(6p)

Genes

Majority have no TCR rearrangement; EBV clonally integrated and plays a role in the etiology of the disease.

Disease

Anaplastic (Ki 1+) large cell lymphoma.

Phenotype/cell stem origin

TdT-, CD1a-, CD3+/- CD30+ (Ki 1+), CD15-, CD25+, HLA-Dr+, CD71+.

Clinics

Aggressive with skin nodes and extranodal involvement.

Cytogenetics

t(2;5)(p23;q35)

Genes

Fusion gene NPM-ALK; 2p23 -Nucleolar phosphoprotein- NPM; 5q35 -Anaplastic lymphoma kinase- ALK.

Disease

Intestinal T-cell lymphoma.

Phenotype/cell stem origin

TdT, CD1a-, CD3+, CD8+, CD103+, CD4-, CD8-.

Clinics

Bone pain, coeliac disease, mesenteric nodes.

Genes

EBV genome present in mexican population but not in the europeans.

Disease

T-lymphoblastic Lymphoma/leukaemia (T-Lbly/T-ALL).

Phenotype/cell stem origin

TDT+, CD1a+, CD7+, cytCD3+ or +/-, other T-cell antigens.Thymic uncommitted T-cell.

Clinics

Aggressive; course similar to ALL. Mediastinal mass, high WBC.

Cytogenetics

del(6)(q21-q22)
t(11;14)(p13;q11)
t(1;14)(p34;q11); 1p34: tal-1gene; 14q11: TCR alpha.

Genes

TCR chain genes rearranged.

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