Atlas of Genetics and Cytogenetics in Oncology and Haematology

OPEN ACCESS JOURNAL AT INIST-CNRS

Leukaemia Section

Mini Review

Peripheral T-cell lymphoma not otherwise specified (PTCL-NOS)

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Published in Atlas Database: July 2009

Online updated version : http://AtlasGeneticsOncology.org/Anomalies/PeripheralTlymphoID2096.html
DOI: 10.4267/2042/44784

Clinics and pathology

Disease

Peripheral T-cell lymphomas not otherwise specified (PTCL-NOS) include a heterogeneous group of diseases involving lymph nodes and extra nodal sites deriving from the clonal expansion of mature T-lymphocytes bearing clonally rearranged TCR genes.

Phenotype/cell stem origin

The cell of origin is an activated mature CD4+ lymphocyte.
The phenotype is usually CD4+/CD8-, TCRβ+ whereas the expression of CD7 and CD5 may be low. Occasionally, CD30 may be positive.

Epidemiology

There is geographic variation in the incidence of T-cell lymphoma. PTCL-NOS accounts for approximately 4-7% of all non Hodgkin's lymphomas and for 30-70% of all mature T-cell lymphomas.

Clinics

The disease runs an aggressive clinical course.

Pathology

The proliferation effaces the lymph node architecture, with paracortical or diffuse growth pattern. The cells are medium-to-large sized, with irregular nucleus, distinct nucleoli. Mitotic figures may be numerous.

Treatment

Anthracycline-based regimes such as CHOP yields

unsatisfactory results with lower CR rates than in B-cell diffuse large cell lymphomas and high relapse rate.

Intensive regimens such as hyperCVAD with or without autologus bone marrow transplantation may be effective in this type of lymphoma, though the superiority of this approach over conventional treatment has not been definitely proven.

Prognosis

Reported failure free survival rates ranged between 12 and 45% (Armitage, 2006).

Cytogenetics

Cytogenetics molecular

Complex karyotypes are reported in 70-90% of the cases (Rizvi et al., 2006).
Recurrent chromosome gains were described to involve 7q, 8q, 17q and 22q, whereas recurrent regions of loss of chromosome material were represented at 4q, 5q, 6q, 9p, 10q, 12q and 13q (Pileri et al., 2008).
In a recent study, frequent gains involved 7q22q31 (33%), 1q (24%), 3p (20%), 5p (20%) and 8q24qter (22%). Losses occurred at 6q22q24 (26%) and 10p13pter (26%).
Complex karyotypes were predictive of an inferior outcome, but no association was noted between specific aberrations and survival (Nelson et al., 2008).
Array comparative genomic hybridization (CGH) for high-resolution analysis of PTCL-NOS identified a region with high copy number gain at 14q32.2, and a region with homozygous loss at 9p21.3. Gains of 7p and 7q and loss of 9p21.3 showed a significant association with poor prognosis (Nakagawa et al., 2009).
p53 protein overexpression and mutation of p53 may be found in 30% of the cases and may correlate

significantly with treatment failure and worse overall and disease-free survival (Pescarmona et al., 2001).
Recurrent copy number gain may also involve chromosomes 8, 9 and 19. Other genomic imbalances may include overexpression of CARMA1 at 7p22 and of MYCBP2 at 13q22, both genes being localized within regions of frequent copy number gain.
LOH was found at 2q34 (Fujiwara et al., 2008).

References

Pescarmona E, Pignoloni P, Puopolo M, Martelli M, Addesso M, Guglielmi C, Baroni CD. p53 over-expression identifies a subset of nodal peripheral T-cell lymphomas with a distinctive biological profile and poor clinical outcome. J Pathol. 2001 Oct;195(3):361-6

Armitage JO.. Peripheral T-cell lymphoma. In: Canellos GP, Lister TA, Young BD: The Lymphomas 2nd edition. Saunders Elsevier, Philadelphia, 2006, pp 437-450.

Rizvi MA, Evens AM, Tallman MS, Nelson BP, Rosen ST. T-cell non-Hodgkin lymphoma. Blood. 2006 Feb 15;107(4):1255-64

Fujiwara SI, Yamashita Y, Nakamura N, Choi YL, Ueno T, Watanabe H, Kurashina K, Soda M, Enomoto M, Hatanaka H, Takada S, Abe M, Ozawa K, Mano H. High-resolution analysis of chromosome copy number alterations in angioimmunoblastic T-cell lymphoma and peripheral T-cell lymphoma, unspecified, with single nucleotide polymorphism-typing microarrays. Leukemia. 2008 Oct;22(10):1891-8

Nelson M, Horsman DE, Weisenburger DD, Gascoyne RD, Dave BJ, Loberiza FR, Ludkovski O, Savage KJ, Armitage JO, Sanger WG. Cytogenetic abnormalities and clinical correlations in peripheral T-cell lymphoma. Br J Haematol. 2008 May;141(4):461-9

Pileri SA, Weisenburger DD, Sng I, et al.. Peripheral T-cell lymphoma not otherwise specified. In Swerdlow SH, Campos E, Harris NL et al (eds). WHO classification of tumours of haematopoietic and lymphoid tissue. IARC, WHO press Geneva Switzerland, 2008.

Nakagawa M, Nakagawa-Oshiro A, Karnan S, Tagawa H, Utsunomiya A, Nakamura S, Takeuchi I, Ohshima K, Seto M. Array comparative genomic hybridization analysis of PTCL-U reveals a distinct subgroup with genetic alterations similar to lymphoma-type adult T-cell leukemia/lymphoma. Clin Cancer Res. 2009 Jan 1;15(1):30-8

This article should be referenced as such:

Cuneo A, Ciccone M, Cavazzini F, Rigolin GM. Peripheral T-cell lymphoma not otherwise specified (PTCL-NOS). Atlas Genet Cytogenet Oncol Haematol. 2010; 14(6):591-592.