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Leukaemia Section
Short Communication

+4 or trisomy 4

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Clinics and pathology

Disease

Acute non lymphocytic leukaemia (ANLL)

Epidemiology

+4 as the sole anomaly is a rare chromosomal abnormality associated with a specific subtype of primary ANLL and secondary (treatment related) ANLL with myelomonocytic morphology; it has been found with the same frequence in the M1-M2 and M4 French-American-British (FAB) phenotypes.
Association of +4 with double minute chromosomes has been described in ten cases; five with AML-M2, two with AML-M4, one with refractory anemia with excess of blasts in transformation (RAEB-T), one with chronic myelomonocytic leukemia (CMMoL) and one with unclassified preleukemia.
The coincidence of +4 with t(8;21) or its variant t(6;21;8), observed in at least two cases of ANLL (M1 and M2), is therefore recurrent.

Prognosis

Apparently +4 has no prognostic significance in ANLL; with the exception of the cases bearing c-Kit mutations who are associated with a rapid disease progression.

Disease

Acute lymphocytic leukaemia (ALL)

Epidemiology

+4 has been described in two cases of T-cell acute lymphoblastic leukemia as the sole chromosomal anomaly.
Combined trisomies of chromosomes 4 and 10 are found in children with B-progenitor cell acute lymphoblastic leukemia with a favourable prognostic association.

Prognosis

Patients with chromosomes 4 and 10 trisomies have an extremely favourable 4-year event-free survival (EFS) after antimetabolite-based chemotherapy.

Disease

Thecoma of the ovary

Epidemiology

+4 associated with +12 has been described in two cases of fibrothecoma and in one case of thecoma; it has been suggested that acquisition of trisomy 4 may constitute a second cytogenetic step in tumor progression of ovarian thecoma/fibrothecoma.

Prognosis

No prognostic significance.

Disease

+4 has been found as the sole aberration only in one case of uterine leiomyoma.

Genetics

Note
Trisomy 4 was proven to lead to duplication of Asp816Tyr mutation of c-Kit gene (that maps to 4q12) in a case of M2-ANLL with mast cell involvement.

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