t(8;14)(q11;q32)

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Identity

- 8, + der(14) t(8;14)(q11;q32) G banding (left) - Courtesy Gitte Birk Kerndrup and Steen Rosthoj; der(14) t(8;14)(q11;q32) R-banding - Courtesy Pascale Cornillet-Lefebvre and Stephanie Struski (top), and with a constitutional trisomy 21 (bottom) - Courtesy Petr Balicek, Jana Rabasova, and Jiri Hak. More iconography can be found in the Case Report section (see below).

Clinics and pathology

Disease
CD10+ acute lymphoblastic leukemia (ALL) in most cases; chronic myelogenous leukemia (CML) very rarely; one case of histioyte-rich B-cell lymphoma.

Etiology
Strikingly, more than 1/4 of cases are Down syndrome patients.

Epidemiology
At least 52 cases to date (see Ref. below); the t(8;14)(q11;q32) represents about 1/1 000 cases of childhood leukemias; median age is 11 years (range 3-49), with 10% above 20 years; unbalanced sex ratio (29M/18F).

Clinics
Organomegaly is not frequent, central nervous system (CNS) involvement was not noted; WBC was < 50 X 10^9/l in most cases.
Prognosis
Prognosis is likely to be not bad, although a long follow up is missing in about half of the cases (see Figure 2).

Cytogenetics

Cytogenetics morphological
Sole (acquired) anomaly in 1/3 of cases; accompany a t(9;22)(q34;q11) in 20% of cases; unbalanced form with a der(14) t(8;14) in 15% of cases, indicating that the crucial event is likely to lie on der(14). One case was a three way translocation t(2;14;8).

Additional anomalies
t(8;14) may be found with t(9;22) (see above); t(8;14) is accompanied by an acquired (not constitutional) +21 in 10% of cases; +X, +8, and del(13q) are also recurrently found with t(8;14).

Genes involved and proteins

CEBPD
Location
8q11
Protein
DNA-binding protein. CCAAT enhancer-binding protein (CEBP) transcription factors are a family of 6 multifunctional basic leucine zipper (bZIP) transcription factors. The 5 other CEBPs are: CEBPA (19q13), CEBPB (20q13), CEBPE (14q11), CEBPG (19q13), all four equally implicated in leukemias, and DDIT3/CHOP/CEBP zeta (12q13), so far known to be involved in solid tumours (liposarcoma). These transcription factors play a key role in cellular differentiation, in particular in the control of myeloid differentiation. CEBPD is composed of a N-term transactivation domain, a DNA-binding basic motif, and a leucine-zipper domain in C-term (Ramji et al., 2002; Nerlov et al., 2007).

IgH
Location
14q32
Result of the chromosomal anomaly

Fusion protein
Oncogenesis
Overexpression of the CEBP gene.

To be noted
Case Report
A case of pre-B ALL with t(8;14)(q11;q32).
A case of Down syndrome with acute lymphoblastic leukemia and t(8;14)(q11;q32).
A new case of t(8;14)(q11;q32) in an acute lymphoblastic leukemia.

References
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