

Abstract:

Cytogenetic analysis of cells of chronic lymphocytic leukemia (CLL) is difficult because of their low proliferative activity. To obtain sufficient number of mitoses for performing chromosomal analysis a suitable stimulation of cell division is needed. Using DSP30/IL2 stimulated cultivation 391 CLL samples were investigated in 5 years' period. The cultivation was showed to have high success rate (96%; 375/391) with also high rate of detection of pathological clones by both karyotype and metaphase FISH analyses (in 84% of samples; 329/391). Almost in half of samples (44%; 171/391) other aberrations than recurrent FISH (i.e. 13q14 deletion, trisomy 12, TP53, ATM genes deletions) were found. Also high frequency of translocations (37%; 144/391), complex karyotypes (28%; 111/391) and clonal evolution, which was detected in one third of all samples (34% of samples with presence of more than two clones; 133/391) and like a new event in disease duration even more frequently (in 39% of samples repeatedly investigated after stimulated cultivation; 21/54), was revealed. The presence of translocations, complex karyotypes and clonal evolution was associated with progressive form of disease (P 0,000003, resp. P 0,0002 and P 0,05/P 0,04). In cases of the recurrent deletions the detailed analysis of metaphase chromosomes showed unbalanced translocation to be an alternative mechanism of the losses. Moreover, for 13q14 deletion a coexistence of more clones with independent deletions was proved and for the first time described in the literature. Significant clonal evolution, including multiclonality of 13q14, manifests considerable heterogeneity of tumor cell population in CLL. The presented results give evidence of importance of cytogenetic analysis of CLL cells after stimulated cultivation.