FICTION-TSA analysis of the B-cell compartment in myeloma shows no significant expansion of myeloma precursor cells

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Abstract

Studies utilizing flow cytometry and PCR have shown that the B-cell compartment in myeloma contains cells which are clonally related to the myelomatous plasma cells. Current data, however, remains inconclusive regarding the extent of this involvement. By combining fluorescent immunophenotyping, tyramine signal amplification and fluorescence *in-situ* hybridization (FICTION-TSA), we have used the presence of numerical chromosomal abnormalities within plasma cells as a clonal marker to examine the $CD20^+$ B-cell compartment for the presence of aneuploidy. A series of 54 cases of myeloma were screened for the presence of numerical abnormalities of chromosomes 3 and 11. FICTION-TSA was performed on 13 cases with either trisomy 3 or 11 and on a control group of six cases known to be disomic for the two chromosomes. B-cell numbers were reduced in the myeloma cases compared to the normal controls (median 1.8% *v* 3.0%, $P = 0.05$). In the cases with a chromosomal marker, three signals were seen in a median of 1.88% of $CD20^+$ B cells compared to 2.58% within the control group. Comparison of the two groups using a Wilcoxon-Mann-Whitney U test showed no statistical significant difference. Using this data set, it was possible to exclude a 3.03% expansion of clonally related B cells (95% confidence level). We conclude that the B-cell compartment in myeloma does not represent the major site of clonal expansion, and if clonally related cells are present then the numbers are few.

Keywords: multiple myeloma; fluorescence *in-situ* hybridization; FICTION; aneuploidy; B lymphocytes

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