Letter to the Editor-I

Acute Lymphoblastic Leukemia in Children: Changing Immunophenotypic Pattern in Northern India

Sir,

Acute lymphoblastic leukemia (ALL) is a lymphoid neoplasm, in which variations are known to exist in the prevalence of subtypes, in relation to geographic, environmental, socio-economic, ethnic and racial factors.[1] Immunophenotyping of acute leukemia plays an important role in management and understanding of acute leukemia.[2] In the West, the predominant immunophenotype observed in ALL in children is c-ALL, accounting for 60-80% of cases whereas T-ALL comprises only 11-20%.[3] In contrast, earlier studies from Eastern countries like Japan, Nigeria, Kenya, TelAviv (Israel) & South Africa have shown higher incidence of T-ALL.[4] Previous studies from India have reported a lower incidence of c-ALL and a higher proportion of T-ALL.[5,6] This high frequency of T-ALL has been attributed to the poor socio-economic status and/or to low frequency of c-ALL here. During the past 10 years, India has evolved socio economically and has succeeded in curbing a large number of infective diseases. Whether this has had an effect on the sub type of leukemia in India or not has not yet been evaluated. With this in mind, in the present study, we evaluated the changes in immunophenotypic patterns of ALL in children over the past 10 years. 271 children (≤15yrs) diagnosed to have ALL at department of Haematology, AIIMS, between 1991 and 2004, were the subjects of this study. The diagnosis was based on morphologic and cytochemical characterization of leukemia. Immuno-phenotyping was done for all cases by indirect immunoflorescence technique using a panel of monoclonal antibodies (CD3, CD2, CD5, CD7, CD4, CD8, CD10, CD19, HLADR, SmIg, CyIgM, CD13, CD14, CD33, MPO.[5] The leukemia's were classified into B-lineage ALL if the expression of the CD marker was seen in >20% of total cells for CD10, CD19, HLADR, and T-lineage ALL if CD marker was positive (seen in >20% of total cells) for CD2, CD3, CD5, CD7, CD4, CD8. The immunophenotypic patterns obtained were assessed in 2 groups (Table 1): group A patients enrolled from 1991 to 1996, group B patients enrolled from 1997 to 2004. 89 of the 150 (59%) ALL patients belonging to group A were characterised as B-lineage ALL and 45 (30%) as T-lineage ALL. In group B, 84 of the 121 (69%) patients were found to be B-lineage and 27 (22%) to be T-lineage. Thus, a declining trend of T-lineage ALL accompanied by an increasing trend in B-lineage ALL in group B was observed Moreover, the socio-economic status of the patients, based on education status and occupation of the parents, type of residence, access to adequate sanitation and the physicians judgment was also evaluated. It was observed that the number of cases with low socio economic status decreased from 58.9% in group A to 54.9% in Group B, whereas there was a mild increase in the number of cases of moderate/ high socio economic status (Fig-1). There was no effect of socio-economic status on age/sex, WBC or overall survival. However, event free survival of T-lineage ALL was significantly higher than B-lineage in patients with WBC>50x10^9/L

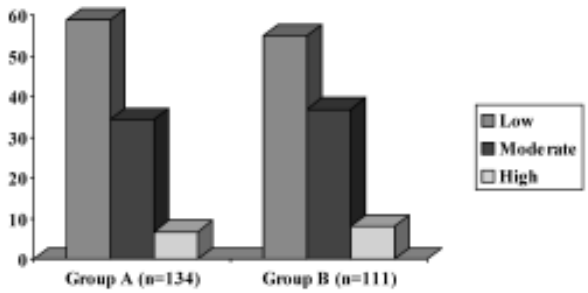

Figure –1: No. of cases of ALL and their socioeconomic status

Table 1: Immunophenotypic patterns of ALL in children

	Year 1991 - 1996 (n=150) n (%)	Year 1997 - 2004 (n=121) n (%)
T-lineage	45 (30%)	27 (22%)
B-lineage	89 (59%)	84 (69%)
Null	1 (0.6%)	4 (3.3%)
Biphenotypic	13 (8.6%)	3 (2.4%)
Undifferentiated	1 (0.6%)	3 (2.4%)

Note: None of the comparisons were significant

(60% vs. 20%, p=0.009) (Kaplan Meier test). It thus appears that there is a changing pattern of ALL in India. Alterations in immunophenotyping patterns have also been observed in UK and US early in the century.[4] With the improvement of environmental factors like industrialization and socio-economic status, high incidence of common ALL was known to emerge in these countries. In India too, it is possible that the increased and early control of infections in our country may contribute to the higher prevalence of B lineage ALL than in the previous years. However, the difference in pattern of immunophenotype in groups A and B is not statistically significant (chi-square test;c^2), this trend may be due to chance also. Another reason could be use of more sensitive techniques/antibodies of immunophenotyping over 12 years period as reflected by decrease in the number of biphenotypic leukemia. It thus appears that a change is constantly taking place in the biology of acute leukemias in the Indian patients. However, its impact on the treatment outcome of ALL in children remains to be elucidated.

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