ORIGINAL ARTICLE

TDT: A Diagnostic Marker in Acute Lymphoblastic Leukemia

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ABSTRACT

Objective: To differentiate Acute Lymphoblastic Leukemia from Acute Myeloid Leukemia and to Isolate TdT positive blasts in CSF.

Selection of Subjects A total number of 35 subjects were included in this study. They were divided into three groups. They were selected from the services Hospital, Lahore General Hospital and Sheikh Zayed Hospital. 35 subjects were divided into three groups:- Group A included 25 patients of acute lymphoblastic leukemia. Group B 05 patients of acute myeloid leukemia and Group C 05 normal control subjects.

Results: Patients with Acute lymphoblastic leukaemia (Group A) had TdT positive blasts in peripheral blood smear while acute myeloid leukaemia (Group B) had no Tdt+ve Blasts in peripheral smear. Out of 25 patients of ALL, 06 (24%) patients of ALL had TdT positive blasts in Cerebrospinal Fluid Staining. All patients (Group A) are Sudan Black B and myeloperoxidase negative while AML patients (Group B) are Sudan Black B and myeloproxidase positive.

Key words: TDT, ALL, AML,

INTRODUCTION

Leukemias are group of diseases in which abnormal proliferation of haemopoietic cells causes progressive infiltration of the bone marrow, although in certain forms the lymphatic tissues are particularly effected[1]. Leukemia as a disease involving the bone marrow was first identified by Neumann in 1870. The leukemic blasts cells accumulate in the marrow and suppress the differentiation and Proliferation of normal hamopoietic cells.

In acute leukaemias there are >50% lymhoblasts or myeloblasts in the bone marrow. They originate either in a lymphopoietic stem cell (acute lymphocytic leukaemia, ALL) or in a hemopoietic stem cell or progenitor cell (acute myelogenous leukaemia, AML)[2]. The chronic leukaemias comprise of two main types, chronic myeloid leukaemia (CML) and chronic lymphocytic leukaemia (CLL). Other chronic types include hairy cell leukaemia, prolymphocytic leukaemia and various leukaemia/lymphoma syndromes[3,4].

METHODOLOGY

A total number of 35 subjects were included in this study. They were divided into three groups. They were selected from the services Hospital, Lahore General Hospital and Sheikh Zayed Hospital. Thirty five subjects were divided into following groups:-

Group A: Included 25 patients of acute lymphoblastic leukemia.

Group B: Included 05 patients of acute myeloid leukemia.

Group C: Included 05 normal control subjects.

Specimen collection: A minimum of 5 ml. blood was drawn from each patient with a sterile disposable syringe fitted with 21 gauge needle and immediately transferred to a clean glass tube containing EDTA in ratio of 1 mg of EDTA per ml of blood for routine haematological investigations. Push smears for routine and special stains were immediately prepared form blood without adding EDTA to it, smears for TdT staining were air dried followed by fixation in methyl alcohol and subsequently wrapped in aluminium foil and stored desiccated at -20° C.

RESULTS

The details of results are given in tables 1, 2 and 3

Table 1: Comparison of blasts in group A and B

Groups	Group A (ALL)	Group B (AML)
Mean ± SD	32.2 ± 4.21	56.0 ± 5.92
Range	09 – 85	32 – 78
Total	25	05

Statistical Analysis A vs B $p<0.05$ (Significant)

Table 2: Comparison of TDT+VE blasts in PBF in group A and B

Groups	Group A (ALL)	Group B (AML)
Mean ± SD	53.0 ± 11.63	Zero
Range	29 – 72	Zero
Total	25	Zero

Statistical Analysis A vs B $p<0.01$ (Highly Significant)

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Table 3: Comparison of TDT +ve blasts in CSF in group A and B

Groups	+ve patients	-ve patients	Total
Group A	06 (24%)	19 (76%)	25
Group B	Zero	05 (100%)	05

Statistical Analysis A vs B $p<0.01$ (Highly Significant)

DISCUSSION

In this study, mean ± SD values of Blasts in Groups A, B and C were 32.2±4.21 and 56.0±5.92 with ranges of 09 – 85 and 32 – 78% respectively. Group B showed increased number of blasts when comparing with group A and difference was highly significant statistically ($p<0.01$). This study is in favour of the results of Firkin et al (1989)[5], Bradstock et al (1980) [6]and Bradstock et al (1995)[7], who also observed these changes in ALL and AML patients.

In this study, TdT Positive Blasts in CSF of Group A were 24% (06) while group B (AML) did not show any TdT +ve blast in CSF and different was highly significant ($p<0.01$) statistically. These results are consistent with the study of Bradstock et al (1980)[6], Casper et al (1983)[8], Firkin et al (1989)[5], who also observed Tdt+ve blasts in CSF of ALL patients (Group A). Patients of AML (Group B) showed no TdT+ve blasts in CSF.

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