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Research Article

ASSOCIATION BETWEEN PATTERNS OF BIO-CHEMICAL FACTORS AND BONE MARROW INFILTRATION AMONG PATIENTS PRESENT WITH NON-HODGKIN LYMPHOMA¹Dr. Chaudhry Shahzad Aslam, ²Dr Syed Ahmed Shahzaem Hussain, ³Dr Syed Ahmed Shahzain Hussain¹Medical Officer, Civil Hospital Kotla Arab Ali Khan, Gujrat²Allama Iqbal Medical College, Lahore³Shaikh Khalifa Bin Zayed al Nahyan Medical and Dental College, Lahore

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Abstract:

Objectives: This research work aimed to interrogate the pattern of involvement of bone marrow in the patients present with NHL (Non-Hodgkin's Lymphoma) and to associate the pattern of β 2-m (β 2 microglobulin) & LD2 (Lactate Dehydrogenase-2) levels of these present patients.

Methodology: this transverse research work carried out for a period of complete two years in General Hospital, Lahore. This research work carried out on fifty patients irrespective of gender and age separated into 2 groups i.e. Group-A containing twenty healthy controls whereas Group-B consisting thirty patients of non-Hodgkin lymphoma with the infiltration of bone marrow. We performed bilateral trephine biopsy of bone marrow to evaluate the patterns of infiltration of bone marrow. The determination of serum β 2-m and LD-2 levels in already identified thirty patients of non-Hodgkin lymphoma. We compared these values with twenty healthy gender and age match controls. The determination of the correlation coefficients carried out with the utilization of the Pearson's correlation coefficient. We made the estimations before the establishment of chemotherapy.

Results: There was significant rise in the levels of β 2-m and LD-2 (P -value < 0.050) in the patients of NHL with the advancement of disease as compared to the healthy controls. These markers of serology displayed negative correlation (-0.2350 for β 2-m & -0.1330 for LD-2) with disease spread and involvement patterns in the patients of NHL.

Conclusion: With the observation of patterns of involvement of bone marrow in the patients of NHL possible instruction about the treatment and prognosis protocols can be taken as the markers of serology levels associate with the disease spread an involvement pattern in NHL patients.

Key Words: NHL, significant, association, correlation, bone marrow, determination, serum, chemotherapy.

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INTRODUCTION:

Lymphomas characterize the clonal malignancies of lympho-reticular system in which most of the cells are frozen at only single stage of the normal differentiation [1]. The most 2 broad kinds of lymphomas are HD & NHL [2]. There are more than one hundred diseases in the group of cancer, all of these diseases start with the development of the abnormal cells. There is continuous division of the cancerous cells into new cells with abnormality and they grow without control [3]. Generally, there is better prognosis of follicular pattern as compared the diffuse pattern [3, 4]. There is variation in the prevalence of marrow abnormalities with histological sub-type of disease of NHL. Trepine biopsy of bone marrow is much vital in the identification of the involvement of bone marrow for the purpose of treatment [5]. Any among the 3 patterns like interstitial, diffuse or focal can be available in combination or alone [6, 7].

The patients present with the high failure risk with the traditional treatment may advantage from investigational methods. There distinguishable biological identifiers of NHL are present in 3 categories; serological, immune-phenotypic & molecular markers. Among the most vital markers of serology, β 2-m shows tumor load & LD shows the invasive potentials of disease of lymphoma [8]. High destruction or production of the cells results to increase the levels of β 2-m in blood [9]. The molecular weight of LD is 135000 Daltons. There are 5 isozymes of LD which are different slightly in their structure. There is concentration of LD-2 lymphocytes [10, 11]. This research work carried out to determine the patterns of involvement of bone marrow in the patients of NHL and to find correlation these patterns with the level of β 2-m and LD-2 in NHL patients.

METHODOLOGY:

Table-I: Mean values of p2m and LD2 Levels in Patterns of Bone Marrow Infiltration.

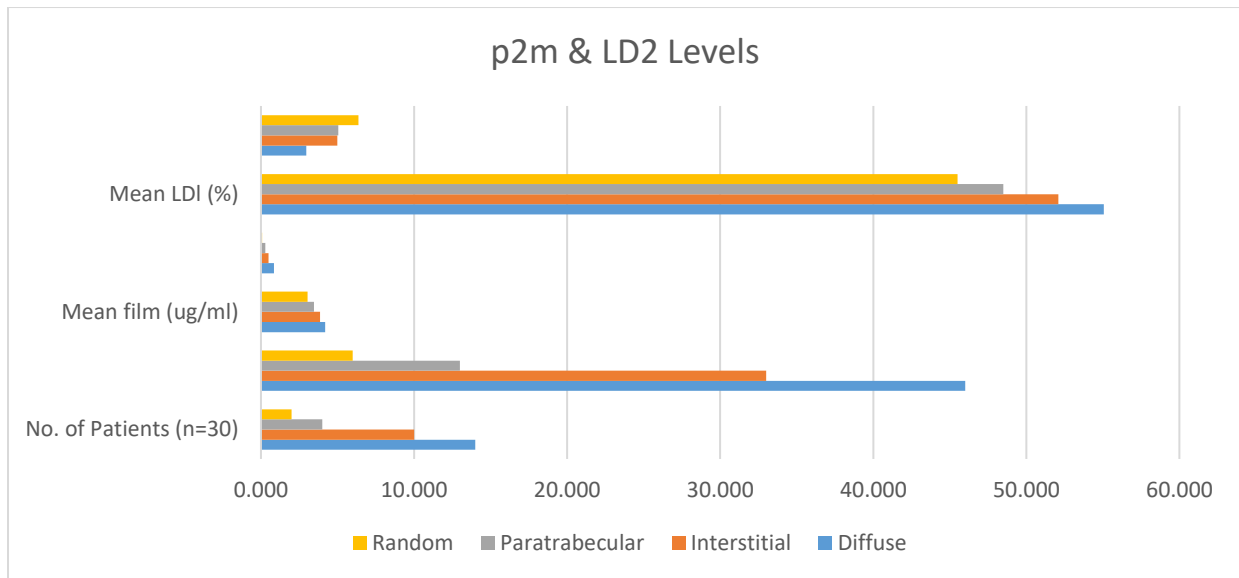
Bone Marrow Patterns	No. of Patients (n=30)		Mean film (ug/ml)		Mean LDL (%)	
	Mean	SD	Mean	SD	Mean	SD
Diffuse	14.000	46.000	4.200	0.840	55.070	2.970
Interstitial	10.000	33.000	3.870	0.490	52.100	4.990
Para trabecular	4.000	13.000	3.470	0.280	48.500	5.060
Random	2.000	6.000	3.050	0.070	45.500	6.360

This research work consisted fifty patients divided into two groups; Group-A consisting twenty healthy controls and Group-B comprising thirty NHL patients with the infiltration of bone marrow. We used the international standard for the estimation of the sample size. This research work carried out for a duration of complete two years in General Hospital, Lahore. We included the newly identified patients of NHL with the use of lymph node biopsy before chemotherapy from both genders and all groups of ages as samples of this research work. We excluded the patients suffering from other serious diseases to reach the precise results. We carried out the bilateral trephine biopsy of bone marrow bilaterally from left & right posterior superior iliac spine to evaluate the patterns of infiltration of bone marrow.

The estimation of the β 2-m performed by ELISA (Enzyme Linked Immunosorbent Assay). Agarose Gel Electrophoresis were in use for the measurement of LD-2 at CEMB (Centre of Excellence in Molecular Biology), Lahore. The analysis of the findings carried out with the utilization of the Student T-test with 95.0% CI (Confidence Interval). P-value of less than 0.050 was significant. The statistical analysis of the collected information carried out with the utilization of SPSS V. 22. We performed the correlation with the utilization of Pearson's Correlation Coefficient. We took the written consent from all the patients after describing them the purpose of this research work. We ensured the confidentiality of the gathered data from patients.

RESULTS:

In the patients of NHL, diffuse pattern of infiltration of bone marrow was the most common observed in 46.0% (n: 14) patients followed by the interstitial infiltration in 33.0% (n: 10) patients. There was presence of para-trabecular pattern in 13.0% (n: 4) patients whereas random type was available in 6.0% (n: 2) patients (Table-1).



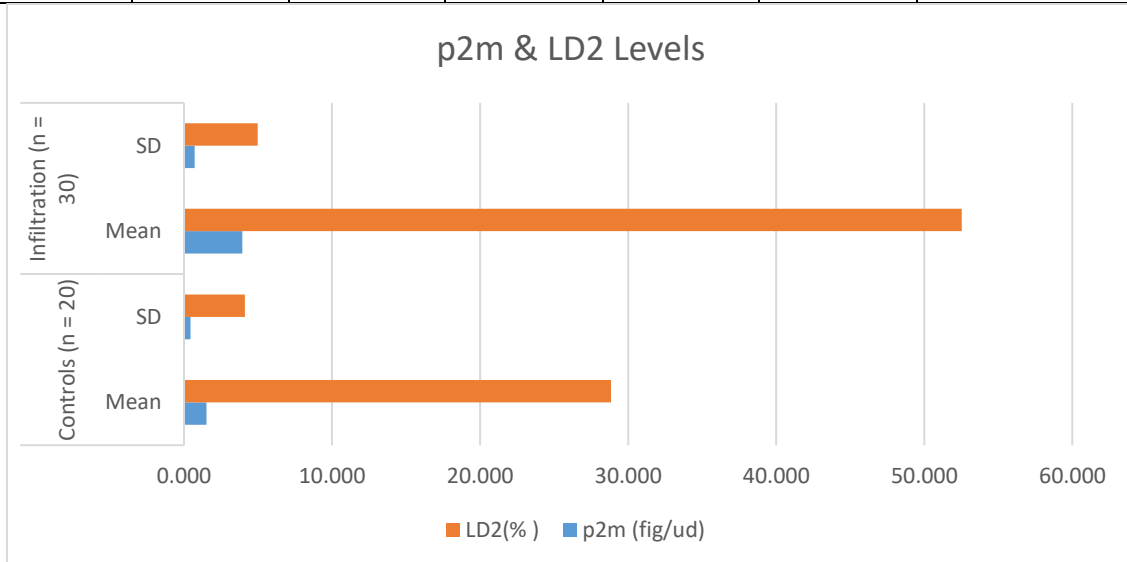
As the biopsy of bone marrow carried out bilaterally, the yield of positive patients of infiltration of bone marrow was high. There was diffuse pattern in 9 patients unilaterally and in only five patients bilaterally. As regards the interstitial pattern, we observed it unilaterally in 7 patients & bilaterally in three patients whereas para-trabeular pattern was present in 3 patients unilaterally & in 1 patient bilaterally. We observed the random pattern in two patients unilaterally.

Among patients with the diffuse pattern, average level of $\beta 2$ -m was 4.20 ± 0.840 , in interstitial was

3.870 ± 0.490 whereas para-trabeular & random had 3.470 ± 0.280 and $3.050 \pm 0.070 \mu\text{g/ml}$ correspondingly and values of LD-2 in diffuse, interstitial, para-trabeular & random patterns were 55.070 ± 2.970 , 52.10 ± 4.98 , 48.50 ± 5.060 and $45.50 \pm 6.35\%$ respectively as presented in Table-1. There was significant correlation of levels of $\beta 2$ -m and LD-2 among healthy controls and infiltration of bone marrow of patients present with NHL (P-value < 0.050) with the negative values of correlation for $\beta 2$ -m and LD-2 were -0.2350 and -0.1330 respectively (Table-2).

Table-II: p2m and LD2 levels in controls and NHL patients with bone marrow infiltration.

Parameters	Controls (n = 20)		Infiltration (n = 30)		P value	Pearson Correlation
	Mean	SD	Mean	SD		
p2m (fig/ud)	1.520	0.430	3.930	0.710	<0.0500	0.2350
LD2(%)	28.850	4.107	52.530	4.967	<0.0500	0.1330



DISCUSSION:

In the patients of NHL, diffuse pattern of infiltration of bone marrow was most common being observed in 46.0% (n: 14) patients followed by the interstitial infiltration in 33.0% (n: 10) patients. In focal variety, para-trabecular pattern was available in 13.0% (n: 4) patients whereas random type was available in 6.0% (n: 2) patients. Diffuse pattern was present in nine patients unilaterally and bilaterally in 5 patients. In interstitial pattern, we discovered unilaterally in 7 patients and bilaterally in 3 patients whereas para-trabecular pattern was available in 3 patients unilaterally and bilaterally in one patient. We observed the random pattern in 2 patients unilaterally. In current research work, markedly increased serological markers levels as $\beta 2$ -m and LD-2 were present with association with diffuse pattern particularly. Mora, Miyashita & Yoo C observed the same outcomes [12-14]. According to the research works of Yoo C & Nakajima Y [15, 16], $\beta 2$ -m seems to show tumor burden of the malignant cells. According to the findings of Ding D, Yoo C & Rotaru I [17-20]; this observation of $\beta 2$ -m & LD-2 associates with spreading the NHL and with possibly adverse prognosis in such patients.

Diffuse pattern was most frequent pattern of the involvement in NHL along with marked rise in levels of $\beta 2$ -m and LD-2. Haddadin [21] discovered the diffuse pattern of bone marrow infiltration in 28.0% patients. Jeong [22] observed that out of five hundred and seven patients suffering from malignant lymphoma, 93.30% (n: 473) patients were present with NHL (Non-Hodgkin Lymphoma) and regarding the pattern of involvement of bone marrow, the most common pattern was the diffuse pattern of infiltration (40.0%). Arber, Moid and Gurjal [23-25] found the similar observations in their research works. There was overall adverse prognosis with the diffuse pattern type in their research work. These observations were much in agreement with the present research work. There are some limitations of this research work as this research work was a transverse research work. There is need of other research works to understand the proper pattern understanding of the infiltration of bone marrow in the patients of NHL with the levels of $\beta 2$ -m and LD-2.

CONCLUSION:

With the observation of the involvement of bone marrow in the patients of NHL, possible instruction about the treatment and prognosis can be taken. Serological markers have correlation with the disease spreading and involvement patterns in the patients of NHL.

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