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CLINICO-HAEMATOLOGICAL PROFILE OF LYMPHOMA IN NORTH WEST INDIA: AN INSTITUTIONAL BASED PROSPECTIVE STUDY

Pathology

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ABSTRACT

Background: Lymphomas are malignant neoplasm of cells native to the lymphoid tissue. Lymphomas are broadly categorised into Hodgkin Lymphoma (HL) and Non-Hodgkin's Lymphoma (NHL). The incidence of HL is lower than that of NHL and in contrast to NHL, HL exhibits several specific patterns of age-incidence curves, depending on socio-economic status of population.

Aims: To evaluate the Clinico- Haematological profile in patients of lymphoma and to determine the frequency of bone marrow infiltration in these cases.

Material and Methods: This observational study was carried out in the Department of Pathology. 60 cases with confirmed diagnosis of lymphoma, referred to the Haematology section of the Department of Pathology were included in the study. Detailed clinical history and haematological profile of the patients was evaluated followed by bone marrow biopsy. Bone marrow biopsy was evaluated for evidence of infiltration. Findings were recorded in detail and results tabulated.

Observations: 60 diagnosed patients of lymphoma formed the material of the study, including 51 patients of NHL and 9 patients of HL. Majority of the patients were seen in 51-60 years age group with male predominance. Lymphadenopathy was the commonest clinical presentation followed by generalised weakness. 56 (93.3%) patients had nodal site of involvement at presentation while 4 (6.7%) patients had extra nodal involvement. Bone marrow infiltration by the atypical lymphomatous cells was seen in 25 (41.7%) cases (24 cases of NHL and 1 case of HL). Anaemia was observed in 88% patients with bone marrow involvement while majority of patients with marrow involvement had normal leukocyte (72%) and platelet (72%) counts.

Conclusions: Lymphadenopathy is the commonest presenting complaint in patients of lymphoma. Bone marrow biopsy can diagnose the marrow infiltration and contribute to the prognosis. Anaemia was the commonest peripheral blood abnormality followed by thrombocytopenia in patients with marrow involvement.

KEYWORDS

Lymphoma; Trephine Biopsy; Anaemia; Lymphadenopathy

INTRODUCTION:

Lymphoid malignancies or lymphomas are malignant neoplasm of lymphoid cells. Incidence of lymphoma exhibits a marked geographic variation, being higher in North America, Australia, New Zealand and Europe and lower throughout Asia and Africa except Burkitt's lymphoma which is endemic there [1]. Broadly the lymphoid neoplasms have been divided into Hodgkin's Lymphoma (HL) and Non-Hodgkin's Lymphoma (NHL). The incidence of HL is consistently lower than that of NHL. In underdeveloped countries, a peak in early childhood with predominance of Mixed cellularity subtype is followed by an older adult peak (>50years). In developed countries, a peak in young adulthood with predominance of nodular sclerosis subtype is followed by an older adult peak [1]. Though the etiology of HL is unclear, viral factors especially Epstein Barr virus infection may play a causal role [2]. In contrast, NHL is predominantly seen in older age groups and increased risk of NHL has been reported to be associated with various non-modifiable risk factors such as age, sex, and other factors [3].

The diagnosis of lymphomas is made on histopathological findings on lymph node biopsy including Haematoxylin & Eosin staining and immunohistochemistry. Bone marrow involvement is the definite evidence of disseminated disease and bone marrow assessment provides important information in making decisions regarding the treatment. In patients with bone marrow involvement, the marrow smears and trephine sections are collectively interpreted for cytology, pattern of bone marrow infiltration and sometimes immunophenotyping [4]. Both bone marrow aspiration and biopsy are performed, however trephine biopsy is preferred procedure in detection of marrow involvement.

Limited data is available in literature regarding the clinico-haematological profile of lymphoma throughout India, particularly North West India. So the study was performed to investigate the patients of lymphoma with thorough insight into the clinical and haematological profile.

MATERIAL AND METHODS:

The present observational study was conducted in Department of pathology in a tertiary care institute. The study was approved by Institutional ethics committee. Total of 60 cases with confirmed diagnosis of lymphoma referred to the Haematology section of the Department of Pathology from other departments were included in the study. Non-cooperative patients, patients with poor karnofsky Performance Score, patients with coagulopathies, local skin infection or lesion at biopsy site and allergy to xylocaine were excluded from the study.

The socio-demographic and clinical data pertaining to patient's age and sex were recorded. A detailed clinical history was taken from the patients and complete data of each patient was prepared. Findings of general physical and systemic examination including lymphadenopathy, hepatomegaly and splenomegaly were also recorded. The EDTA anticoagulated venous samples were received from the patients and were run on automated haematology analyzer. Haematological profile of the patient including complete blood counts (CBC), Haemoglobin (Hb), total and differential leukocyte count and platelet count were recorded. Detailed peripheral blood film examination was also carried out after staining the blood film by Leishman's stain.

After explaining the procedure for bone marrow biopsy, a written informed consent was taken from each patient. Bone marrow trephine biopsy was performed by using the Jamshidi's needle from posterior iliac spine taking all aseptic precautions. Skin, subcutaneous tissue and periosteum overlying the selected site was infiltrated with 2% xylocaine. Trephine specimen, was then obtained by inserting the biopsy needle into the bone and using to and fro rotation to obtain a core of tissue. Imprint smears were taken before the specimen was transferred into the fixative. The bony core was gently dabbed or rolled across the slide, which was then be fixed and stained with MGG stain to prepare imprint smears. Biopsy specimen underwent decalcification followed by routine processing in the department and blocks prepared. The slides were stained with H&E and reticulin stain. The slides were evaluated by trained haematologists for morphological findings. In case of any discrepancy, the diagnosis of senior haematologist was

considered. Data was analyzed using the Statistical Package for the Social Sciences. The results were expressed as mean for quantitative variables and presented as frequency & percentages for qualitative parameters.

RESULTS:

Sixty patients with confirmed diagnosis of lymphoma formed the material of the study with age range of 4-78 years. Majority of the patients were seen in 51-60 years age group (Table 1) with a mean age of 52.1 years. Out of 60 patients, 40 were male and 20 were female with male to female ratio of 2:1. Lymphadenopathy was the most common clinical presentation (56.7%) followed by generalised weakness (41.7%) and splenomegaly (18.3%) (Table 2). Cervical chain was the commonest involved lymph nodal chain followed by generalised lymphadenopathy.

51 patients with NHL and 9 patients with HL were identified in our study. NHL was classified using international working formulation. Maximum cases of NHL were low grade (41.18%) followed by high grade (39.21%) and intermediate grade (19.61%) NHL. Among cases of HL, 8 (88.9%) cases were of classical type with a single case of lymphocytic predominant HL (11.1%). 93.3% had nodal site of involvement at presentation while 4 (6.7%) cases had extra nodal sites (two from ileum, one from colon and one from stomach). All these extra nodal cases were NHL. Bone marrow infiltration by the atypical lymphomatous cells was seen in 25 (41.7%) cases, including 24 cases of NHL and 1 case of HL. Bone marrow infiltration was observed in 23 cases with nodal disease and 2 cases with extra-nodal disease.

In patients with bone marrow involvement, mean Hb level was 9.2gm/dl while anaemia was observed in 88% patients (Hb ≤11gm/dl). Among them, 48% patients had moderate anaemia (Hb: 6-9gm/dl) and 8% had severe anaemia (Hb<6gm/dl) (Table 3). Majority of the patients (44%) had dimorphic anaemia followed by normocytic hypochromic anaemia (40%) and microcytic hypochromic anaemia (16%). Majority of patients with marrow involvement had normal TLC (4000-11000/mm^3) while 24% of patients showed evidence of leucocytosis (TLC>11000/mm^3) (Table 3). Leukopenia (TLC<4000/mm^3) was observed in a single case with bone marrow involvement. With respect to platelet counts, majority of the patients with marrow involvement (72%) had normal platelet count (1.5-4 lakhs/ mm^3). Thrombocytopenia was present in 7 patients (platelet count <1.5 lakhs/ mm^3) (Table 3).

DISCUSSION:

The term lymphoma is used for malignant neoplasm of lymphoid cells and is broadly divided into HL and NHL. Malignant lymphoma is a common haematological malignancy and comprises 3.37% of all malignancies worldwide [5]. Lymphomatous infiltrates are most commonly encountered in a bone marrow biopsy taken for lymphoma staging or for diagnosis of a suspected haematological abnormality. Though crucial for staging, bone marrow biopsy may show classic and variant patterns of lymphomatous infiltration and immunoprofile [6].

60 diagnosed patients of lymphoma who underwent bone marrow biopsy formed the material of study. Majority of the patients in the study were seen in 51-60 years age group with mean age 52.1 years and age range of 4-78 years. Majority of patients in our study were males with M:F ratio of 2:1. Comparable results were observed by Lee SJ et al [7] and Panneerselvam R et al [8]. Lymphadenopathy was the commonest clinical presentation in our study (34/60, 56.7%). Similar results were observed by Hingorjo MR et al [9] and Devi AA et al [10] who observed lymphadenopathy as the most common presenting clinical presentation. In our study, cervical lymph nodes were the most commonly involved group (16/34, 47.0%). Comparable results were obtained in a study by Devi AA et al. [10] in which cervical lymphadenopathy was present in 65.0% patients.

Of these 60 patients with lymphoma, 51 (85%) patients had NHL while HL was observed in 9 (15%) patients. Similar results were observed by Hingorjo MR et al [9]. NHL was classified as low, intermediate and high grade based on international working formulation. In our study, low grade NHL was seen in 41.18% cases, high grade in 39.21% cases and intermediate grade in 19.61% cases. Kaur K et al [11] in their study of 85 patients with NHL observed low grade in 68.2% cases, intermediate grade in 28.2% and high grade in 3.5% cases. In our study, HL cases comprised of 88.9% cases of classical HL and 11.1% cases of Lymphocyte predominant HL. 56 patients in our study had nodal site of involvement at presentation while 4 (6.7%) had extra nodal site (two from ileum, one from colon and one from stomach). Prevalence of extra nodal NHL was found to be 23.5% in a study by Bhatia P et al [12] which could be explained due to their large sample size and hence inclusion of more cases of extra nodal lymphoma.

Bone marrow infiltration by the lymphoma was seen in 25 (41.7%) cases, including 24 cases of NHL and 1 case of HL, similar to observations of Kaur K et al [11]. Bone marrow infiltration was observed in 23 cases with nodal disease and 2 cases with extra-nodal disease. Previous studies have reported that bone marrow involvement occurs in about 40% of all lymphoma cases in Western countries [13]. The incidence of bone marrow involvement in HL in our study was 11.1%, similar to previous studies by Sudalaimuthu M et al [14] and Chakrabarti S et al. [15]. In NHL, bone marrow involvement was seen in 47.1% cases in our study, similar to results of Kumar S et al [16]. In patients with extra-nodal NHL, Bone marrow involvement was seen in 50% cases, similar to results of Panneerselvam R et al [8]. Among NHL, maximum involvement was seen in low grade NHL 57.14% (12/21) followed by intermediate grade NHL 50% (5/10) & high grade NHL 35% (7/20).

In our study (22/25) 88% cases with marrow infiltration showed abnormalities in CBC. 21/24 (87.5%) cases of NHL and 1/24 (12.5%) case of HL with bone marrow involvement had CBC abnormalities. CBC abnormalities included anaemia (21/24), leukocytosis (6/24), leukopenia (1/24) and thrombocytopenia (6/25). Different results were observed Kaur K et al [11] who observed CBC abnormalities in only 48.5% cases of bone marrow involvement. Lim EJ et al [17] observed anaemia, one or more abnormal counts and lymphocytopenia in 66%, 85.1% and 41.3% cases of NHL with marrow involvement. In the present study, majority of the patients with bone marrow involvement (50%) had moderate degree of anaemia with haemoglobin levels in the range of 6 to 9 gm/dl. Yasmeen T et al [18] also observed similar results and found that anaemia was more common in patients with stage IV disease (59.1% patients) and severity of anaemia was moderate in all stages.

CONCLUSIONS:

Lymphadenopathy is the commonest presenting complaint in patients of lymphoma. Examination of trephine biopsies in lymphoma patients can help determine marrow infiltration and guides clinician for appropriate treatment modalities, thus improving overall prognosis. Bone marrow involvement is more common in NHL as compared to HL. Anaemia was the commonest peripheral blood abnormality followed by thrombocytopenia in patients with marrow involvement.

Tables:

Table 1: Age Distribution of patients with Lymphoma (n=60)

Age in Years	No of Patients	Percentage
0-10	3	5
11-20	4	6.7
21-30	4	6.7
31-40	3	5
41-50	6	10
51-60	20	33.3
61-70	12	20
71-80	8	13.3
Total	60	100

Table 2: Clinical history in 60 patients of lymphoma

Clinical History	No of Patients	Percentage
Lymphadenopathy	34	56.7
Pain Abdomen	9	15.0
Fever	8	13.3
Follow up case of Lymphoma	9	15.0
Generalised Weakness	4	6.7
Splenomegaly	2	41.7
Miscellaneous	11	18.3

Table 3: Complete Blood Counts in patients with bone marrow involvement

Hemoglobin level (gm/dl)		Total Leukocyte Count (/mm^3)		Platelet Count (lakhs/ mm^3)	
Hb	No.	TLC	No.	Platelets	No
<6	2	<4000	1	<1	2
6-9	5	4000-11000	18	1-1.5	5
>9	18	>11000	6	1.5-4	18

Figure Legends:

Figure 1. Peripheral Blood Film showing a uniform population of small mature lymphocytes and smudge cells in a patient of chronic lymphocytic leukaemia/small lymphocytic lymphoma (Leishman stain, 400x).

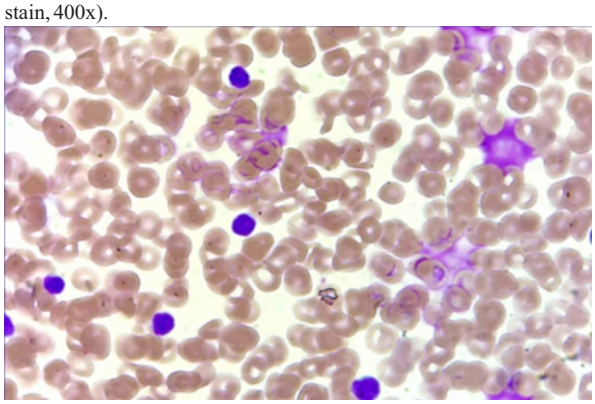
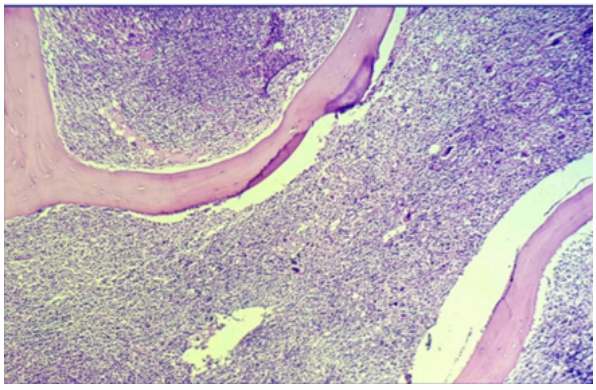


Figure 2. Bone marrow trephine biopsy section showing diffuse (packed marrow) pattern of infiltration in a case of high grade lymphoma (H&E, 100X).



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REFERENCES

1. Huh J. Epidemiologic overview of malignant lymphoma. Korean J Hematol. 2012;47(2):92-104.
2. Tang Y, Sun LG, Liu CS, Li YY, Jin CH, Li D et al. Clinical analysis of stages of HBV infection in 100 cases of lymphoma. Asian Pac J Cancer Prev. 2013;14(2):959-962.
3. Skibola CF. Obesity, Diet and Risk of Non-Hodgkin Lymphoma. Cancer Epidemiol Biomarkers Prev. 2007 Mar;16(3):392-5.
4. Bain BJ. Bone marrow trephine biopsy. J Clin Pathol. 2001;54(10):737-742.
5. Huh J. Epidemiologic overview of malignant lymphoma. Korean J Hematol. 2012 Jun;47(2):92-104
6. van der Walt JD. Lymphomas in the bone marrow. Diagn Histopathol. 2010 Mar;16(3):125–42.
7. Lee SJ, Suh CW, Lee SI, Kim WS, Lee WS, Kim HJ et al. Clinical characteristics, pathological distribution, and prognostic factors in non-Hodgkin lymphoma of Waldeyer's ring: nationwide Korean study. Korean J Intern Med. 2014 May;29(3):352-60.
8. Panneerselvam R, Jayanandhini M, Dhanalakshmi S, Sakunthala P, Vijaya Baskar. Involvement of bone marrow in various lymphomas- A study of 60 cases. Med Int J of Medicine 2017 May;4(5):586-589.
9. Hingorjo MR, Syed S. Presentation, staging and diagnosis of lymphoma: a clinical perspective. J Ayub Med Coll Abbottabad. 2008 Oct-Dec;20(4):100-103.
10. Devi AA, Sharma TD, Singh YI, Sonia H. Clinicopathological profile of patients with non-hodgkin's lymphoma at a regional cancer center in Northeast India. J Sci Soc 2017 Feb;44(3):140-44.
11. Kaur K, Sharma N, Gupta K, Gulati S, Choudhary P. Hematological and Bone Marrow Biopsy Evaluation in Non Hodgkin Lymphoma. Int J Cur Res Rev 2017 Feb;9(3):24-27.
12. Bhatia P, Das R, Ahluwalia J, Malhotra P, Varma N, Varma S et al. Hematological Evaluation of Primary Extra Nodal Versus Nodal NHL: A Study from North India. Indian J Hematol Blood Transfus. 2011 Jun;27(2):88-92.
13. Lambertenghi-Deliliers G, Annaloro C, Soligo D, Oriani A, Pozzoli E, Quirici N et al. Incidence and histological features of bone marrow involvement in malignant lymphomas. Ann Hematol. 1992 Aug;65(2):61-65.
14. Sudalaimuthu M, Basu D. Clinicopathological Features of Bone Marrow Infiltration in Hodgkin Lymphoma. Should Bone Marrow Staging Be Done Only in High Risk Patients ? Clinicopathological Features of Bone Marrow Infiltration in Hodgkin Lymphoma. Should Bone Marrow Staging Be Done Only in High Risk Patients?. Turk Patoloji Derg. 2017;33(2):129-133.
15. Chakrabarti S, Sarkar S, Goswami BK, Mondal S, Roy A, Das S. Hodgkin's and Non-Hodgkin's lymphomas in an Indian rural medical institution: comparative clinicopathologic analysis. Asian Pac J Cancer Prev. 2010;11(6):1605-8.
16. Kumar S, Rau AR, Naik R, Kini H, Mathai AM, Pai MR, Khadilkar UN. Bone marrow biopsy in non-Hodgkin lymphoma: A morphological study. Indian J Pathol Microbiol. 2009 Jul-Sep;52:332-8.
17. Lim EJ, Peh SC. Bone marrow and peripheral blood changes in non-Hodgkin's lymphoma. Singapore Med J. 2000 Jun;41(6):279-285.
18. Yasmeen T, Ali J, Khan K, Siddiqui N. Frequency and causes of anemia in Lymphoma patients. Pak J Med Sci. 2019 Jan-Feb;35(1):61-65.