RESEARCH ARTICLE

Study of extra-nodal lymphoma with special reference to histomorphology, immunohistochemistry, and topographical distribution

Gunadhar Singh Sardar¹, Goutam Bandyopadhyay², Anadi Roy Chowdhury³, Manas Talukdar⁴

¹Department of Blood Bank, North 24 Parganas District Hospital, Barasat, West Bengal, India, ²Department of Pathology, Burdwan Medical College, Burdwan, West Bengal, India, ³Department of Pathology, Murshidabad Medical College, Berhampore, West Bengal, India, ⁴Department of Pathology, Medical College and Hospital, Kolkata, West Bengal, India

Correspondence to: Manas Talukdar, E-mail: talukdarmanas09@gmail.com

Received: October 01, 2021; Accepted: October 18, 2021

ABSTRACT

Background: Primary extra-nodal lymphomas (ENLs) are rare neoplasms but can affect many organ systems of the body. Proper and timely diagnosis and justified treatment of primary ENL are often affected due to the variety of lymphoma types and the relative rarity of many of these tumor types. They are mainly Non-Hodgkin lymphomas which further consist of many subtypes having variation of epidemiology and clinical presentation along with geographic distribution. Aim and Objectives: Aim and objectives of the study were to find out topographical distribution and histological patterns of ENL along with their immunohistochemical character in a tertiary care hospital of Eastern India. Materials and Methods: All the cases from April 2015 to March 2018 diagnosed as ENL by histopathological examination were included in this descriptive cross-sectional study for further immunohistochemical analysis for CD45 Life-cycle assessment (LCA), CD3, and CD20 to identify the cell of origin (B cell vs. T cell). Results: Out of total 31 cases, 67.74% were male and the most common age group was 51–60 years. Gastrointestinal tract was the most common organ system (61.29% of cases) affected and stomach (29.03%) followed by ileum (9.67%) were the most common sites affected by ENL. Histomorphologically diffuse large cell lymphoma was the most common pattern while immunohistochemistry study revealed all the cases were B cell type with LCA and CD20 positive and CD3 negative. Conclusion: This study revealed the topographical pattern along with predominant histomorphological and immunohistochemical character of ENL in study population. However, further studies with meta-analysis can enlighten these characters more comprehensively.

KEY WORDS: Immunohistochemistry; Extra-nodal Lymphoma; Histomorphology

INTRODUCTION

Primary extra-nodal lymphomas (ENLs) are the lymphoid neoplasms that virtually always present in extra-nodal sites and appear to correspond to the normal lymphoid cells specific for extra-nodal immunologic reaction. The entity of extra nodal lymphoma appears to develop in unexpected location and no tissue is exempted. Only when nodal origin has been excluded the lesion may be regarded as primary ENL. The most frequently involved organ system is the Gastrointestinal tract (GIT) followed by other tissues such as Waldeyer’s ring (when tonsil is considered as an extranodal site), lung, liver, spleen, bone and skin. Incidence of ENL is rising nowadays. Various different causes have been attributed to this changing trend of lymphoma such as immunodeficiency state in HIV infection, increasing use of immunosuppressive therapy, and indolent viral infection. Proper and timely diagnosis and justified treatment of primary extranodal lymphoma
are often affected due to variety of lymphoma types and the relative rarity of many of these tumor types. ENL are mainly of Non-Hodgkin lymphoma (NHL) which further consists of many subtypes having variation of epidemiology and clinical presentation and also by geographic distribution. The diagnosis of extranodal lymphoma is basically a multistep process requiring clinico-pathological correlation and immunohistochemistry (IHC) study with rational choice of antibodies. Most of the literatures on extra nodal lymphomas are mainly from western countries, and there is paucity of data from Eastern part of India. With this background, the current study has been carried out to find out topographical distribution and different histological pattern of extra nodal lymphomas along with their immunohistochemical character.

MATERIALS AND METHODS

This is a hospital-based descriptive cross-sectional study performed in the Department of Pathology of the tertiary care hospital of Eastern India after Approval of Institutional Ethics Committee. All the cases from April 2015 to March 2018 (3 years) diagnosed as ENL by histopathological examination along with thorough history and clinical details (to exclude secondary involvement) have been included in this study for further immunohistochemical analysis. All the paraffin blocks were retrieved and stained with Haematoxylin and Eosin stain. The slides were then examined under light microscope to identify the pathological area. For IHC, tissue sections of 2–3 micron thickness were cut and fixed with poly-L-lysine coated slides. Following paraffin removal and rehydration, antigen retrieval was done by Pressure cooker methods. Then, sections were incubated with commercially available primary antibody of CD45 Life-cycle assessment (LCA), CD3 and CD 20 to identify the cell of origin (B cell vs. T cell). Sections later were washed and treated with diaminobenzidine and hydrogen peroxide (DAB chromogen solution) for 5 min. Sections were counterstained with haematoxylin. Appropriate positive and negative controls were used for each of the antibodies. Statistical analysis was done with the help of the software program SPSS for windows, version 15 (SPSS Inc., Somers, NY).

RESULTS

Out of total 31 cases of ENL during study period, 21 (67.74%) were male and rest 10 (32.26%) were female. Regarding age distribution, Figure 1 shows ENLs were the most common in 51–60 years of age group (48.38%) in the present study \((P < 0.05)\). GIT system is the most common organ system (61.29% of cases) affected by ENL according to this study [Table 1]. Table 2 shows the distribution of cases according to various anatomical sites. Stomach (29.03%) followed by Ileum (9.67%) are the most common sites of ENL in this study. In head-neck region, parotid and tonsil were the sites of involvement.

Table 3 shows type of ENL by histomorphology pattern only and accordingly, diffuse large cell lymphoma is the commonest one followed by MALToma. IHC study revealed all the cases are B cell type with LCA and CD 20 positive and CD3 negative [Table 4, Figure 2].
DISCUSSION

Overall, extra nodal lymphoma cases are rare with only 31 cases have been diagnosed in 3 years in this tertiary care hospital of Eastern India. Gastro intestinal tract is the most common system and stomach is the most common organ to be affected by ENL. All the cases are of B cell type and most common type of ENL is diffuse large B cell lymphoma in this study.

ENL is comparatively rare variant of NHL and hence uncommonly encountered in routine surgical pathology practice. Incidence of NHL is increasing worldwide and this has been observed in India too. In India, as per the estimates, there are approximately 23,718 new NHL cases reported each year.[4] As per current study, ENL are more common in the age group of 51–60 years with the median age of 55 years (48.38%). The youngest patient was 15 years male child with diffuse large B cell lymphoma of ileocecal region, and the oldest was 68 years female with diffuse large B cell lymphoma of skin. Mishra et al. described primary extra-nodal NHL constituting 22.6% (68/300) of all NHL, and the majority of patients were from higher age group with peak incidence seen in fourth to fifth decade of life.[7] In our study, it was observed in much higher age group. ENL is predominant in males with the male:female ratio 2.1:1 in this study, which nearly correlate with the study of Padhi et al., Mishra et al. and Aparna et al.[7-9] Sharma et al. described the occurrence of NHL and males outnumbered females (29/47, 61%).[10] This male preponderance has also been reported in other studies of Kalyan et al., and Sengar et al.[11,12] Previous studies by different researchers found that extra nodal NHLs can originate from almost every anatomic site of the body such as GIT (most common), head and neck (Waldeyer’s ring, nose/paranasal sinuses/nasopharynx, salivary glands, etc.), skin, central nervous system, bone, testis, thyroid, breast, orbit, and rarely adrenal, pancreas, and the genitourinary tract.[13-16] Psysiri et al. described gastrointestinal lymphoma is the most common form of ENL, accounting for 30–40% of cases.[17] The most commonly involved site is the stomach (60–75% of cases), followed by the small bowel, ileum, cecum, colon, and rectum. The authors of current study also found similar results with GIT is the most common site of ENL which represent the major percentage (19 cases and 61.29%) followed by head and neck lymphoma [Table 1].

Aparna et al. Studied 31 cases of extranodal lymphoma over 3 years and majority showed B-cell lymphomas and among the B-cell lymphomas diffuse large B-cell lymphoma was the most common variant.[9] Mouna et al. studied seven cases of breast lymphoma diagnosed over an 8-year period (2002–2010).[18] Histology revealed diffuse large B-cell lymphoma in all cases. The current study also revealed similar results [Tables 3 and 4]. This can be supported by the general consensus that T-cell lymphomas are relatively rare as shown by Sharma et al. who found 89% of NHLs to be B-cell lymphomas and Bhardwaj and Kishore who reported that B-cell lymphomas constitute 80% of NHLs.[10,19] However, in a study, only on oral cavity lymphoma, Kalyankar found that plasmablastic is the most common type followed by DLBCL.[20]

The strength of the study lies in its attempts to explore topographical and histomorphological pattern of a relatively rare tumour which had been addressed seldom before by researchers. Regarding limitations, other important IHC markers such as CD10, Bcl6, and MUM-1 for further research could not be used due to limited resources. Furthermore, the low sample size because of rare cases may be an independent risk factor to create statistical fallacies.

CONCLUSION

Overall, extra nodal lymphoma cases are rare and gastrointestinal tract is the most common system, and stomach is the most common organ to be affected by ENL. All the cases are of B cell type and most common type of ENL is diffuse large B cell lymphoma in this study. Further studies with longer study period and larger sample size along with Meta-analysis may enlighten the epidemiology, distribution and patho-physiology along with cell of origin in extra nodal
lymphomas in future specially related to different ethnic population.

REFERENCES


