RESEARCH ARTICLE

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Clinicopathological Features of Extranodal Lymphomas: 15 Years' Experience of a Single Center

ABSTRACT

Objective: In this study, we aimed to evaluate the localization and histopathological diagnosis, and clinicopathologic characteristics of primary extranodal lymphomas.

Methods: The pathology reports between 2001 and 2015 in the archives of Uludag University Faculty of Medicine Pathology Department were reviewed and all cases with an extranodal lymphoma diagnosis were analyzed. The information about the diagnosis, tumor localization, symptoms at presentation, presence of B symptoms, lymphocytosis and anemia, chronic infection and chronic disease and concomitant secondary malignancy, tumor diameter, the involvement of another extranodal organ, lymph node, bone marrow, spleen, liver, stage of the disease, serum B2 microglobulin, LDH, albumin levels, sedimentation rate were documented. The localization, histopathological types, age groups, male/female ratios in cases of primary extranodal lymphoma were evaluated.

Results: Total sum of 1743 patients were diagnosed with lymphoma. 480 (%27,53) of these cases were extranodal lymphomas. The most commonly encountered locations of extranodal lymphomas were the skin and the gastrointestinal system. There were 226 primary extranodal skin, 90 gastrointestinal system, 44 central nervous system, 8 genitourinary system, 50 head and neck, 18 musculoskeletal system and soft tissue, 9 mediastinum, 3 bronchus, 10 orbital, 2 liver, 6 pancreas, 4 omentum, 8 endocrine system, and 2 breast located cases. 237 of the primary extranodal lymphomas from our work were mature T/NK celled neoplasias. There were 250 patients with mature B cell lymphoma, 5 cases of Hodgkin lymphoma, and 5 cases of precursor lymphoid neoplasia.

Conclusions: The data from our series were coherent with the literature. Due to the small number of cases with some localization and some histopathological diagnosis, no significant results could be reached about these entities.

Keywords: Extranodal Lymphoma, Skin, Gastrointestinal System, Central Nervous System, Diffuse Large B Cell Lymphoma.

Ekstranodal Lenfomaların Klinikopatolojik Özellikleri: 15 Yıllık Tek Merkez Deneyimi

ÖZET

Amaç: Bu çalışmada 2001-2015 yılları arasında tanı alan primer ekstranodal lenfomaların lokalizasyonlarının ve histopatolojik olarak dağılımının, klinikopatolojik özelliklerinin değerlendirilmesi amaçlandı.

Gereç ve Yöntem: Uludağ Üniversitesi Tıp Fakültesi Patoloji Anabilim Dalı arşivindeki 1 Ocak 2001 ile 31 Aralık 2015 arasındaki patoloji raporları gözden geçirildi, lenfoma tanılı bütün olgular incelendi. Hasta dosyaları incelenerek primer olarak ekstranodal bölgeden kaynaklanan olguların tanısı, hastaneye başvuru semptomları, B semptomu varlığı/yokluğu, tümör çapı, başka ekstranodal organ, lenf nodu, kemik iliği, dalak, karaciğer tutulumu olup olmadığı, kronik enfeksiyon ve kronik hastalık varlığı, hastalığın evresi (Ann Arbor sınıflamasına göre), eşlik eden sekonder malignite varlığı, anemi, lenfositoz varlığı, serum B2 mikroglobulin, LDH, albumin değerleri, sedimentasyon hızı bilgileri dökümante edildi. Primer ekstranodal lenfomalı vakalarda belirlenen histopatolojik tanıların dağılımı, tipleri, yaş grupları, kadın/erkek oranları literatür bilgileri ışığında gözden geçirildi.

Bulgular: 2001 – 2015 yılları arasında Uludağ Üniversitesi Tıp Fakültesi Tıbbi Patoloji Anabilim Dalı'nda toplam 1743 hastaya lenfoma tanısı verilmişti. Bu olguların 480 (%27,53) tanesi ekstranodal kaynaklıydı. Genel olarak en sık görülen ekstranodal lokasyon deri ve gastrointestinal sistemdi. Primer ekstranodal 226 deri, 90 gastrointestinal sistem, 44 santral sinir sistemi, 8 genitoüriner sistem, 50 baş-boyun, 18 kas-iskelet-yumuşak doku, 9 mediasten, 3 bronş, 10 orbita, 2 karaciğer, 6 pankreas, 4 omentum, 8 endokrin sistem, 2 meme yerleşimli olgu mevcuttu. Çalışmamızdaki primer ekstranodal lenfomaların 237'sini matür T/NK hücreli neoplaziler oluşturuyordu. Matür B hücreli lenfomalı 250 hasta mevcuttu. Hodgkin lenfoma tanılı 5, prekürsör lenfoid neoplazi tanılı 5 olgu mevcuttu.

Sonuç: Sonuç olarak çalışmamızdaki veriler literatürle uyumludur. Bazı lokalizasyondaki ve bazı histopatolojik tanılı olguların sayıca azlığı sebebiyle bu antiteler hakkında anlamlı sonuçlara ulaşılamamıştır.

Anahtar Kelimeler: Ekstranodal Lenfoma, Deri, Gastrointestinal Sistem, Santral Sinir Sistemi, Diffüz Büyük B Hücreli Lenfoma.

INTRODUCTION

Lymphoma is the clonal malignancy of the immune system and lymphocytes as a general term that describes a heterogeneous group of diseases (1). Non-Hodgkin lymphomas (NHL) represent about 90% of all malignant lymphomas, while Hodgkin lymphomas (HL) consist of the remaining 10% (2). About a third of NHLs develop from tissues other than the lymph node, and these cases are called extranodal lymphomas (ENL) (3). The definition of ENL is still a confusing problem, especially in the presence of both nodal and extranodal disease. Dawson criteria have been determined for the definition of primary ENL. These criteria are based on the absence of palpable superficial lymph node in the first physical examination, absence of mediastinal lymphadenopathy in the chest X-ray, presence of the dominant lesion in the extranodal region, if there is lymph node involvement, the presence of the white blood cell count in complete blood count should be within normal limits (4). The definition of primary ENL is still controversial in the literature; therefore, the percentages in the studies show more variability than nodal lymphomas. Primary extranodal presentation of stage III and IV lymphomas is questionable, because the secondary extranodal spread may also be present in primary nodal disseminated diseases (5). Krol et al. showed that the rate of ENL can vary between 20% and 34% (6). Recently, the cases have a clinically dominant extranodal component with non-nodal component or minor involvement are accepted as extranodal (5). In this study, we aimed to evaluate the distribution and clinicopathologic characteristics of primary ENLs.

MATERIAL AND METHODS

Pathology reports diagnosed with lymphoma between 2001 and 2015 in the archives of Uludağ University, Faculty of Medicine, Pathology Department were reviewed. The cases which have clinically dominant extranodal component, with non-nodal component or minor involvement were included in the study. Patient files were analyzed. The information about the diagnosis, tumor localization, symptoms at presentation, presence of B symptoms, lymphocytosis and anemia, chronic infection and chronic disease and concomitant secondary malignancy, tumor diameter, the involvement of another extranodal organ, lymph node, bone marrow, spleen, liver, stage of the disease (by the Ann Arbor classification), serum B2 microglobulin, LDH, albumin levels, sedimentation rate were documented. The localization, histopathological types, age groups, male/female ratios in cases of primary ENL were evaluated with the literature information and classification of the World Health Organisation (WHO) Classification of Tumours of Haematopoietic and Lymphoid Tissues (2008,2017) (7,8). Patients with stage III and IV were not included in the study to exclude the possibility of secondary extranodal involvement of a primary nodal onset lymphoma. Cases of acute lymphoblastic leukemia, chronic lymphocytic leukemia, plasma cell myeloma were not included in the study. The study was performed according to the tenets of the Helsinki Declaration and according to approval by the local Ethics Committee of the Uludag University Medical School (prot . No 2016-2/15/EC of 02 February 2016).

Statistical Analysis: Statistical analysis of the study was done in SPSS 22.0 package program. Descriptive statistics of categorical variables in the study are shown with frequency and percentage. Whether there is any change in the diagnosis of the diagnosis by years has been examined by chi-square trend analysis. In the statistical comparisons in the study, if the p-value is below 0.05, it was considered statistically significant.

RESULTS

Between the years 2001 and 2015, 1743 patients were diagnosed as lymphoma in the Pathology Department. The 480 (27.53%) of these cases were from the extranodal origin. The most common extranodal location was the skin and gastrointestinal tract. There were 226 skin, 90 gastrointestinal system, 44 central nervous system, 8 genitourinary system, 50 head and neck region, 18 musculoskeletal-soft tissue, 9 mediastinum, 3 bronchi, 10 orbital, 2 liver, 6 pancreas, 4 omentum, 8 endocrine system and 2 breast located extranodal lymphomas respectively. Mature T / NK cell neoplasms accounted for 237 of the primary extranodal lymphomas in our study. There were 250 patients with mature B cell lymphoma. There were 5 cases with HL and 5 cases with precursor lymphoid neoplasia. Relevant clinicopathological and demographic data are shown in Tables 1,2 and 3, Figure 1.

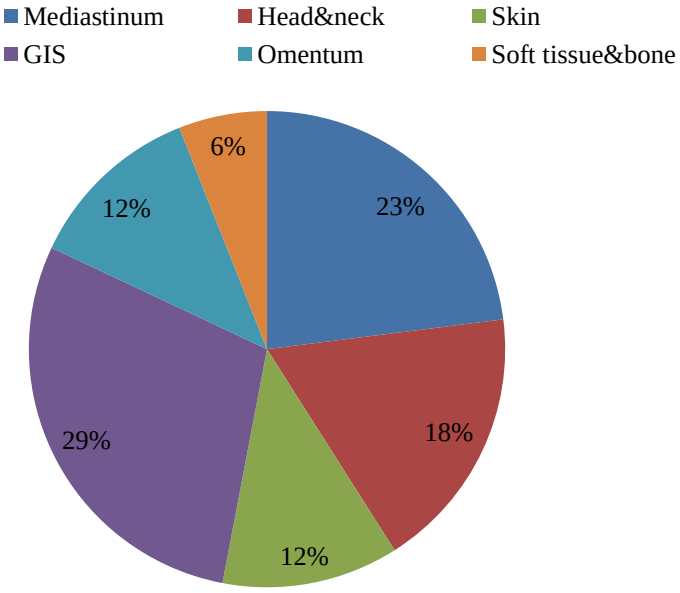

Fig 1. Distribution of tumor locations in pediatric cases

Table 1. Distrubition of extranodal lymphomas

Localisation	Number of cases	(%)
Skin	226	47,1
Gastrointestinal system	90	18.8
Stomach	50	10.4
Small bowel	28	5.8
Colorectal	11	2.3
Eosophagus	1	0.3
Head and neck	50	10.4
Tonsil	28	5.8
Nasal mucosa	6	1.3
Nasapharinx	4	0.8
Oral cavity	3	0.6
Salivary glands	3	0.6
Tongue-basis of tongue	3	0.6
Sinuses	2	0.4
Gum	1	0.3
Central nervous system	44	9.2
Muscles-Skeleton-Soft	18	3.8
tissue	9	1.9
Paravertebral	5	0.7
Bone	1	0.3
Knee	1	0.3
Soft tissue	1	0.3
Muscle	1	0.3
Extremity		
Orbita	10	2.1
Eyelid	3	0.6
Conjunctiva	2	0.4
Lacrimal gland	1	0.3
Eye	1	0.3
Not specified	3	0.6
Mediastinum	9	1.9
Endocrine System	8	1.7
Thyroid gland	5	1.0
Adrenal gland	3	0.7
Urogenital System	8	1.7
Testicle	4	0.8
Kidney	3	0.6
Bladder	1	0.3
Pancreas	6	1.3
Omentum	4	0.8
Bronchus	3	0.6
Liver	2	0.4
Breast	2	0.4
TOTAL	**480**	**100**

Table 2. Histopathological subtypes in pediatric patients

Histopathological diagnosis	Number of cases	(%)
Precursor lymphoid neoplasia	5	29.4
Precursor T cell	5	29.4
Mature B cell neoplasia	10	58.8
Burkitt lymphoma	7	41.2
DBLCL	3	17.6
Mature T cell neoplasia	2	11.8
MF	2	11.8
Total	**17**	**100**

Table 3. Clinical features of extranodal lymphomas in pediatric and adult age groups

CLINICAL FEATURES	ADULT	PEDİATRIC
Number of cases	463	17
Gender		
Male	274	15
Female	189	2
Age groups		
0-5		4
6-9		7
10-19		6
20-29	28	
30-39	59	
40-49	64	
50-59	126	
60+	186	
Nodal involvement	40(8.6%)	1(5.9%)
LDH		
High	61	6
Normal	151	1
Unknown	251	10
B symptoms		
Yes	20	0
No	305	12
Unknown	138	5
Anemia		
Yes	57	3
No	264	7
Unknown	142	7
Lymphocytosis		
Yes	49	1
No	272	9
Unknown	142	7
Albumin		
Low	61	2
Normal	135	6
Unknown	267	9

DISCUSSION

Gastrointestinal System Lymphomas: The gastrointestinal tract is the most common location for extranodal NHL. It constitutes 4-20% of all NHLs and 30-40% of all ENLs (9). There were 90 primary gastrointestinal ENLs in our series. It consists 18.8% of all ENLs. According to the review of Peng et al, the most common location of primary gastrointestinal system lymphomas is the stomach (60-70%), followed by the small intestine, ileocecal region, and colon (10). Primary gastric lymphomas (PGL) in our series constituted 10.41% of extranodal lymphomas and 55.6% of gastrointestinal canal lymphomas.

PGLs are most common in 5 to 6th decades. Men are more affected than women. It is more common in the white race (10). The patient ages in our series were between 27 and 82. The mean age was 58.31. The male to female ratio was 1.63 / 1.

Almost all PGLs are B-cell lymphomas, T cell neoplasms of the stomach and primary gastric HL are extremely rare (11-12). In our series, there were 2 (4%) primary gastric HL cases. There are many studies in the literature reporting that almost

half of B cell PGLs are MALT lymphoma. Diffuse large B cell lymphomas (DLBCL) is the second most common in the stomach, but follicular and mantle cell lymphomas are also common. DLBCL were predominantly observed in the distribution of patients (68%). MALT lymphoma is the second most common lymphoma in the stomach, and represent 7 (14%) of the cases. Mantle cell and Burkitt's lymphoma were equal in number and seen in one case each.

Primary tumors of the small intestine are very rare, representing less than 2% of all gastrointestinal tract malignancies (13). There are 28 cases of small bowel origin in our series, constitute 5.83% of all ENLs and 31.1% of primary gastrointestinal system lymphomas. The ileum is the most common location for primary small bowel lymphomas (PSBL) (60-65%). This is followed by jejunum, duodenum, and other regions (14). Two of the cases in our series were located in the ileocecal region.

PSBLs are more heterogeneous than stomach lymphomas. MALT lymphoma, DLBCL, EATL, mantle cell lymphoma, and immunproliferative small bowel disease (IPSID) are seen in small bowels (15). Twenty four (85.8%) of the cases in our series were mature B cell neoplasia and 2 (7.1%) were T cell neoplasia. DLBCLs accounted for 18 (57.2%) of B cell neoplasms. Burkitt lymphoma was observed in 6 (28.6%) cases. One of two T cell lymphomas was EATL and the other was peripheral T cell lymphoma.

Primary colorectal lymphomas are extremely rare, accounting for only 0.2% of all colorectal tumors. About 6-12% of primary gastrointestinal lymphomas originate from the colorectal region (13). Primary colon lymphomas in our series constituted 2.3% of all ENLs and 12.22% of gastrointestinal system lymphomas.

DLBCL is the most common histological subtype in colon and rectum lymphomas. MALT lymphoma is also commonly seen. Although T cell lymphomas are rare in western countries, their number is increasing in Asian countries (13). Ten (91%) of the cases in our series were of B cell origin. The 7 (63.8%) of them were DLBCL, 2 (18.2%) were mantle cells, 1 (9%) were Burkitt lymphoma. There was 1 (9%) patient with peripheral T cell lymphoma.

Central Nervous System Lymphomas: Primary central nervous system lymphomas (PCNSL) constitute 0.5-1.2% of all intracranial neoplasms and less than 1% of extranodal NHLs (16). There are 44 cases in our series, consist of 9.2% of all ENLs. The incidence of PCNSL has increased in both immunosuppressed and normal individuals in the last three decades (17). There was no significant change in the frequency of PCNSL cases in our series by years ($p = 0.579$). PCNSLs occur at a younger age with immunosuppressed patients. The patients' ages in our series were between 20 and 81, and the mean age was 59.30. The male to female ratio was 1.44 / 1. All of the cases in our series consisted of mature B cell lymphomas.

Skin Lymphomas: Primary cutaneous lymphomas (PCL) are skin-originated non-Hodgkin lymphomas that occur in individuals without evidence of another extracutaneous lymphomatous disease at the time of diagnosis (18). PCLs can develop from both T and B cells. More than 75% of primary skin lymphomas are T cell originated (19). A total of 226 primary cutaneous lymphoma patients diagnosed in our clinic, 223 (98.7%) were mature T cell lymphomas and 3 (1.3%) were mature B cell lymphomas. Mycosis fungoides (MF) is the most common form of cutaneous T cell lymphomas, and it occurs in men two times frequently than women. Most of the cases are 5-6. decades. It rarely affects children and adolescents (20). Patients diagnosed with MF in our series consist of 94.7% all cutaneous lymphomas. There were 124 male and 90 female patients with MF. The male / female ratio was 1.37 / 1. Patient ages ranged from 16 to 89, with a median age of 53.5.

Head&Neck Lymphomas: Lymphomas are the most common neoplasms in the head and neck region after squamous cell carcinomas (21). Malignant lymphomas constitute 5% of all malignancies in the head and neck localization (22). ENLs with head and neck localization was in the 3rd rank after the skin and gastrointestinal tract in our series.

The most common area of head and neck lymphoma is tonsil (56%), followed by the nasopharynx, oral cavity, salivary glands, paranasal sinuses, and tongue root (23). In our series, tonsil was the most frequent site for primary ENLs in the head&neck region. Nasal mucosa (12%), nasopharynx (8%), oral cavity (6%), salivary gland (6%), tongue-base of the tongue (6%), paranasal sinuses (4%) and gingiva (2%), were following frequent localisations respectively.

Some NHL types are particularly common in the head and neck region. The most common B cell neoplasms are precursor B lymphocytic leukemia/lymphoma, MALT lymphoma, follicular lymphoma, mantle cell lymphoma, DLBCL, and Burkitt lymphoma. The most common T and NK cell lymphomas are nasal type extranodal NK / T cell lymphomas (24). B-cell neoplasms constituted 43 (86%) of head and neck lymphomas in our series. The 26 were DLBCL, 5 were Burkitt lymphoma, 5 were follicular lymphoma, 4 were mantle cell lymphoma. Only 6 (12%) of the cases had T cell histology. One case was lymphocyte rich HL.

Muscle-Skeleton-Soft Tissue Lymphomas: Lymphoma can occur anywhere in the musculoskeletal system. Although the secondary involvement of the musculoskeletal system is

common, the primary occurrence is rare (25). Primary musculoskeletal system lymphomas consist of 3.8% ENLs in our series.

According to Bhagavathi's review, primary bone lymphoma is a rare entity; it constitutes 4-5% of ENLs and 3% of all bone malignancies (26). The 27.8% of musculoskeletal lymphomas in our series primarily occurred in the bone. Primary bone lymphomas are seen between the ages of 20-50. There is a male predominance, the male to female ratio is 3: 2 (27). The ages of the patients in our series were between 26 and 80, and the median age was 65. The male to female ratio was 1.5 / 1. Most primary bone lymphomas are DLBCL (26). All of the cases in our series were DLBCL.

Primary skeletal muscle lymphomas cover approximately 0.5% of all ENLs (28). The only case of musculoskeletal lymphoma in our series constituted 0.3% of ENLs.

Mediastinal Lymphomas: Primary mediastinal lymphoma (PML) is rare, constitutes 10% of lymphomas in the mediastinum (29). Nine PML patients in our series accounted for 1.9% of all ENLs. The age range was between 4-57, with a median age of 32. The male to female ratio was 3.5 / 1.

Lymphoblastic lymphoma and DLBCL are the most common subtypes in the mediastinum (29). In our series, 5 (55.5%) of the 9 cases were T lymphoblastic lymphoma and 4 (44.5%) were DLBCL.

Endocrine System Lymphomas: Primary endocrine system lymphomas account for 3% of ENLs (28). In our series, lymphomas originating primarily from the endocrine system constituted 1.7% of all ENLs.

The majority of thyroid lymphomas are B originated. The most common histological subtypes are DLBCL and MALT lymphoma; follicular lymphoma, small lymphocytic lymphoma, and Burkitt lymphoma may also occur (30). More than 90% of reported cases have chronic lymphocytic thyroiditis or Hashimoto's disease (31). Hashimoto's thyroiditis was detected in 40% of the cases in our series. All 5 patients with primary thyroid lymphoma diagnosed in our clinic were all B-cell lymphomas, 2 cases were diagnosed as MALT lymphoma, and 1 case was diagnosed as DLBCL. Two cases were reported as B cell lymphoma, not otherwise specified.

Primary adrenal lymphoma (PAL) is extremely rare. Less than 200 patients with PAL have been reported in the literature. Patients with PAL diagnosed in our clinic accounted for 0.7% of ENLs. Male to female ratio reported in the literature is 2/1 and the average age is 65 (32). In our series, the male to female ratio was 2/1 and the patient ages were between 45-81. All three cases were DLBCL.

Orbital Lymphomas: Primary orbital lymphomas (POL); originates from the conjunctival, lacrimal gland, soft tissues of the eyelid or extraocular muscles constitute 5-15% of all ENLs (33-34). Ten patients with POL in our series accounted for 2.1% of ENLs.

POLs can be seen at any age, but are most frequently diagnosed in the seventh decade. The ages of patients in our series were between 24-92 years and the median age was 64 years. The male to female ratio was 1.5 / 1.

The most common histological subtype is MALT lymphoma in orbit. Other common histological types are lymphoplasmacytic and follicular lymphomas (34). In our series, MALT lymphoma was observed at 60% and DLBCL at 40%, respectively.

Urogenital Tract Lymphomas: Genitourinary lymphomas account for less than 5% of all extranodal NHLs (9). In our study, kidney, bladder, and testicular lymphomas constituted 1.7% of ENLs.

Primary testicular NHLs make up 2% of ENLs (35). Patients diagnosed with primary testicular lymphoma (PTL) in our hospital accounted for 0.8% of all ENLs. PTLs are the most common testicular malignancy between the ages of 60 and 80 (35). The ages of the cases in our series ranged from 58 to 77, the median age was 64.50. The typical presentation is a hard, painless testicular mass with an average diameter of 6 cm. Bilateral involvement occurs in 6-10% of cases (36). All of our cases were unilateral. All of the patients with PTL in our series applied to the clinic with the complaint of swelling in the testicle. The majority (80-98%) of PTLs are DLBCL. All of our patients were DLBCL.

Primary renal lymphomas (PRL) account for 0.7% of all ENLs (37). Patients with PRL in our study accounted for 0.6% of ENLs. Most patients are in the sixth decade, with a mild male predominance (38). The cases in our series were between the ages of 60 and 70, the median age was 65. The female to male ratio was 2/1. B cell lymphomas are the most common type of renal lymphomas (38). All of the cases in our series were DLBCL.

Lymphomas account for approximately 0.2% of bladder-derived primary neoplastic lesions. The only case in our series was a 76-year-old woman who was diagnosed with DLBCL.

Pancreatic Lymphomas: Primary pancreatic lymphoma (PPL) is a rare disease. It constitutes less than 0.5% of all pancreatic masses and less than 2% of all ENLs (39). PPL in our series represents 1.3% of ENLs.

The incidence of PPL increases with age and more common in men (40). The ages of the cases in our series ranged between 33 and 76, and the average age was 52.33. The male to female ratio was 5/1. The most common histological subtype is DLBCL (41). All of our cases were DLBCL.

Breast Lymphomas: Primary breast lymphoma (PBL) is a very rare disease. Only a few hundred cases have been reported in the literature; the majority of these are small retrospective series (42). It constitutes 1.7-2.2% of all ENLs (43). Patients with PBL constitute 0.4% of ENLs in our study. The average age at the time of diagnosis is 60-65. Almost all of the patients are women (43). Two cases with PBL in our series were female patients, one was 43 and the other was 80 years old. The most common histological diagnosis in PBL is DLBCL, both of our cases were DLBCL. Bilateral breast lymphomas are very rare (44). Both cases in our series were unilateral.

Hepatic Lymphomas: Although secondary liver involvement is common in the later stages of lymphoma, primary hepatic lymphoma (PHL) is rare. PHL is liver-derived ENL without other organ involvement. PHL constitutes 0.4% of ENLs (45). A total of 2 cases were diagnosed as PHL in our institute. These cases accounted for 0.4% of ENLs. PHL most often occurs around the age of 55 (45). The male to female ratio is 2.3 / 1 (46). The two cases in our series were females, and their ages were 27 and 66. The majority of PHL is DLBCL. One of the cases in our series is Burkitt's lymphoma; the other has been reported as B cell lymphoma, not otherwise specified.

Pulmonary Lymphomas: Primary pulmonary lymphoma (PPL) is defined as clonal lymphoid proliferation without extrapulmonary involvement at the time of diagnosis (or within 3 months thereafter), affecting the bronchi or parenchyma of one or both lungs. PPLs are very rare. Low-grade B cell forms are most common. High-grade B cell NHLs constitute 11 to 19% of PPL cases. The average age of patients with high-grade PPL is 60 (47). The only case with bronchial DLBCL in our series was a 70-year-old female patient.

The true incidence of non-B cell PPLs is unknown. Tamura et al. reported only one case with T cell lymphoma in a series consisting of 24 PPL cases (48). One patient with T cell PPL in our series was a 61-year-old male.

CONCLUSION

As a result, the data collected from an institution of the Southern Marmara region of Turkey is generally compatible with the literature. The minority in the number of cases with some localisations prevented statistically significant results. There is limited data about ENLs in different regions, further studies with larger series are required to define the most common ENL types in Turkey.

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