Clinical Characteristics and Treatment Outcomes of Patients with Primary Ocular Adnexal Lymphoma at Siriraj Hospital

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ABSTRACT

Objective: Malignant lymphoma represents the most common primary orbital malignant neoplasm.

Materials and Methods: We retrospectively reviewed data and analyzed clinical characteristics and treatment outcomes of patients with primary ocular adnexal lymphoma at Siriraj Hospital, a tertiary health-care and teaching center in Bangkok, Thailand between January 2004 and June 2017.

Results: From the total of 94 patients with primary ocular adnexal lymphoma, 77 cases (81.9%) were indolent, of which extranodal marginal zone lymphoma (EMZL) was the most common (76.6%). Aggressive subtype accounted for 17 cases (18.1%), consisting of diffuse large B-cell lymphoma (9.6%), mantle cell lymphoma (4.3%), and extranodal NK/T cell lymphoma (3.2%). Plasmacytic differentiation was found in half of EMZL and 4 cases of EMZL had association with IgG4-related disease. Most of the patients presented with proptosis (54.3%), followed by a palpable mass (42.6%). Most patients had Ann Arbor stage I (66.3%) with zero ECOG performance status (91.1%). Chemotherapy was the main treatment for both indolent and aggressive lymphomas. The overall response rate and complete response rate were 88.6% and 68.7%, respectively. The 5-year progression-free survival (PFS) and overall survival (OS) rates were 60.1% and 84.2%, respectively. The indolent group had better overall (92.4% vs 69.2%) (P=0.01) and complete response rates (73.1% vs 50%) (P=0.01) than the aggressive group.

Conclusion: Histopathological subtypes and clinical stages of lymphoma are the best indicators of prognosis and treatment outcomes. Chemotherapy was an effective treatment modality for both indolent and aggressive lymphoma subtypes with better treatment outcomes in the indolent group.

Keywords: Primary ocular adnexal lymphoma; extranodal marginal zone lymphoma with plasmacytic differentiation; IgG4-related disease; clinical characteristics; treatment outcomes (Siriraj Med J 2022; 74: 865-873)

INTRODUCTION

Lymphomas are malignant tumors of B or T lymphocytes and, in rare cases, of natural killer (NK) cells. They are divided into Hodgkin lymphoma and non-Hodgkin lymphoma (NHL). Ocular adnexal lymphoma refers to a malignant lymphoproliferative disease that involves the conjunctiva, lacrimal gland, eyelid, or orbit.[1] Despite the uncommon orbital involvement by NHL, it represents the most common primary orbital and ocular adnexal malignant neoplasm.[1-3] Lymphomas are clinically divided

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into two groups. The first group, low-grade lymphoma, includes extranodal marginal zone lymphoma (EMZL) of mucosa-associated lymphoid tissue, follicular lymphoma, small lymphocytic lymphoma, and lymphoplasmacytic lymphoma. The second group, high-grade lymphoma, is composed of diffuse large B-cell lymphoma (DLBCL), mantle cell lymphoma, T-cell lymphoma, and extranodal NK/T cell lymphoma. Most type of ocular adnexal lymphoma is low-grade B-cell NHL. EMZL is the most common subtype, followed by follicular lymphoma, DLBCL, and mantle cell lymphoma.[4–10] Uncommon ocular adnexal lymphoma variants include plasmablastic lymphoma, extrannodal NK/T cell lymphoma, small lymphocyte lymphoma, Burkitt lymphoma, lymphoplasmacytic lymphoma, plasmacytomas, and peripheral T-cell lymphoma, NOS.[4–10] There are many clinical manifestations of ocular adnexal lymphoma. Disease within the lacrimal glands and eye lids usually presents as palpable masses. In case that the disease extends behind the globe, then pain, proptosis, ophthalmoplegia, and globe displacement may be present. Localized plaque (termed a "salmon patch") on the conjunctiva could be presented as an early sign of a conjunctival lymphoma. Orbital imaging typically shows a poorly defined mass that molds to surrounding structures without direct invasion or bony erosion.[11] Suspicion of the diagnosis-either as a result of clinical or radiological findings—should lead to a confirmatory biopsy. Once a definite diagnosis is established, patients are referred for treatment by a multidisciplinary team composed of an ophthalmologist, a hemato-oncologist, a pathologist, and a radiation therapy specialist.

The purpose of this study was to evaluate the clinical characteristics and treatment outcomes of patients with primary ocular adnexal lymphoma at Siriraj Hospital. Deeper understandings gained through this research may contribute to improvements in multidisciplinary therapeutic planning.

MATERIALS AND METHODS

The protocol for this study was approved by the Institutional Review Board, Faculty of Medicine Siriraj Hospital, Mahidol University (COA no. Si 212/2018). Medical records were reviewed to collect data on all patients diagnosed with primary ocular adnexal lymphoma between 1 January 2004 and 30 June 2017 (13 years) at Siriraj Hospital, a tertiary health-care and teaching center in Bangkok, Thailand. The collected data related to the patients' demographics, clinical and pathological assessments, disease stage, treatment modalities, and outcomes. Demographic data consisted of age, sex, provincial address, and underlying diseases. As to the clinical assessment data, they detailed the clinical presentations, affected anatomical locations, laterality, time to diagnosis, and serological findings for lactate dehydrogenase levels and the statuses of the human immunodeficiency, hepatitis B, and hepatitis C viruses. The pathological assessment data comprised the biopsy site, date, and histological subtypes of the lymphomas which were independently reviewed by an experienced ocular pathologist (MU) and hematopathologist (SS). The disease stages were based on the Ann Arbor stage at the time of diagnosis, the Eastern Cooperative Oncology Group (ECOG) performance status, the number of extranodal sites involved, and the International Prognostic Index. In terms of treatment-modality, the details comprised type (chemotherapy, radiotherapy, surgery, immune-modulating therapy, or a combination of such treatment), the number of cycles of each treatment method, the kind of chemotherapy, and the salvage therapies employed for patients with recurrence. The treatment outcome assessments evaluated the responses to treatment, disease status, and current patient-status, all of which were based on WHO criteria. The outcome categories used were "complete response" (disappearance of the lesion), "partial response" (a decrease of ≥ 50% of the longest diameter of the tumor), "stable disease" (a decrease of < 50% or an increase of < 25%), and "progressive disease" (an increase of ≥ 25%). All treatment outcomes were evaluated at the end of treatment, whereas the disease status was appraised at the final follow-up.

Progression-free survival (PFS) was defined as the length of time following the completion of the primary cancer treatment during which a patient remained free of the complications or events that the treatment was intended to prevent or delay. In comparison, overall survival (OS) was defined as the length of time between the date of diagnosis and death from any cause.

Quantitative data were analyzed with descriptive statistics. Univariable analyses were performed with SPSS for Windows, version 16.0 (SPSS Inc., Chicago, Il, USA). A p-value of < 0.05 was considered statistically significant. OS was calculated from the date of diagnosis to the date of the last follow-up or death from any cause. PFS was measured from the date of diagnosis to the date of the last follow-up, relapse/progression, or death from any causes. The probabilities of OS and PFS were estimated using the Kaplan–Meier method and the log-rank test for survival comparison.

RESULTS

From 99 patients diagnosed with lymphoma, after pathological reviews by an experienced ocular pathologist (MU) and hematopathologist (SS), 5 cases were excluded

with 3 cases diagnosed with IgG4-related disease, one case of plasmacytoma and one case of B-cell acute lymphoblastic leukemia. A total of 94 patients with primary ocular adnexal lymphoma were collected which comprised 56 males (59.6%) and 38 females (40.4%). Their ages ranged from 39 to 99 years, with a median of 61.5 years. Median time to diagnosis was approximately 3 months, while the median follow-up duration was 33 months. Most patients presented with proptosis (56%), followed by a palpable mass (42%) and cellulitis (2%). The most commonly involved anatomical locations were the orbit (62%), conjunctiva (17%), lacrimal gland (15%), and eyelid (5%) (Table 1). For the immunophenotype, 90 cases (95.7%) were of B-cell and the remaining 4 cases (4.3%) were of T-cell or NK cell. In terms of subtypes, 77 cases (82%) were indolent, of which extranodal marginal zone lymphoma (EMZL) was the most common (76.6%), followed by follicular lymphoma (2.1%), small lymphocytic lymphoma (1.1%) and unclassifiable small B-cell lymphoma (1.1%). Of the 72 cases of EMZL, there were 37 cases (51.4%) with plasmacytic differentiation. Interestingly, there were 4 cases (5.5%) of EMZL with accompanying IgG4-related disease and 2 of them also showed plasmacytic differentiation. While the aggressive subtype accounted for 17 cases (18.1%), consisting of DLBCL (9.6%), mantle cell lymphoma (4.3%), extranodal NK/T cell lymphoma (3.2%), plasmablastic lymphoma (1.1%) and peripheral T-cell lymphoma, NOS (1.1%). We reviewed the one case diagnosed with unclassifiable small B-cell lymphoma; the tissue biopsy was too small and the patient lost to follow-up so that further clinical examination and tissue biopsy could not be performed. Regarding the other laboratory findings, most patients had normal lactate dehydrogenase levels (92%). Three patients (4%) were found positivity with the human immunodeficiency virus, two (2.7%) tested positive for hepatitis B, while three (4%) were positive for hepatitis C.

After definitive tissue diagnosis and disease staging, the treatments were planned. Of the 94 cases, 64 (68%) were treated at Siriraj Hospital, while the remainder (30; 32%) were referred to other hospitals to meet patients' preference or insurance-coverage requirements. Most patients had Ann Arbor stage I (66.3%) with zero ECOG performance status (91%). Of those, the International Prognostic Index of low risk (82.4%) was the most common (Table 1).

Regarding treatment modalities, 42 (67.2%) cases received chemotherapy and 11 cases (17.2%) received radiotherapy (Table 2). CVP regimen (cyclophosphamide, vincristine, and prednisolone; 59.5%) was the most common chemotherapy regimen, followed by CHOP regimen (cyclophosphamide, doxorubicin, vincristine, and prednisolone; 16.7%) and others. Seven cases (10.9%) received combination chemotherapy and radiotherapy, while a small number of patients (3.1%) underwent surgery only or were administered with an immune modulating agent (1.6%).

Analysis of the treatment outcomes revealed that the overall response rate and complete response rate were 88.6% and 68.7%, respectively. Most cases of indolent subtype were from the first Ann Arbor staging (76.4%) following by 11.1% of stage II, 6.9% of stage III and 5.6% of stage IV. In contrast to aggressive subtype, the staging was varied with 23.5% in stage I, 41.1% in stage II, 5.8% in stage III, and 29.4% in stage IV. The 5-year PFS and OS rates were 60.1% and 84.2%, respectively (Table 3). Subgroup analysis found that the indolent lymphoma group had a 92.4% overall response rate and a complete response rate of 73.1%. 5-year PFS and OS rates for the indolent group were 62.8% and 92.5%, respectively. In aggressive lymphoma types, the overall response rate was 69.2%, with a complete response rate of 50%. The 5-year PFS and OS rates were 50% and 65.9%, respectively. Fig 1A illustrates the Kaplan-Meier PFS rates for various lymphoma subtypes, while Fig 1B presents the Kaplan-Meier OS rates.

DISCUSSION

Results of the current study were compared with those of the study by Yen et al.,[12] which involved a review of the level 3 evidence of 27 studies on ocular adnexal lymphoma treatments. We grouped each of those 27 studies into regions to identify the characteristics of primary ocular adnexal lymphoma specific to each continent (Table 4). Of the 1,938 patients, females predominated slightly (54%)[12] but males predominated in our study (59.6%). The median age at diagnosis (60.1 years) was nearly the same as our study (61.5 years). Their study and our study found that orbit was the most commonly affected anatomical location. However, some other reports found that conjunctiva was the most common site of involvement, followed by orbit.[12] In general practice, orbital lesions are difficult for general ophthalmologists to biopsy so that many patients with proptosis and orbital lesions are referred from primary or secondary care hospitals to our hospital that is a tertiary care center and medical school. This may explain why orbit was the most commonly affected site for primary ocular adnexal lymphoma.

Distribution of the lymphoma subtypes in our study revealed that extranodal marginal zone lymphoma (EMZL) was the most frequent subtype (76.6%), followed by

TABLE 1. Demographic data, clinical assessment, pathological assessment, and stage of lymphoma.

Total patients		**94**
Sex	Male	56 (59.6%)
	Female	38 (40.4%)
Median age at diagnosis (Yr.)		61.5 (range, 39-99)
Median time to diagnosis (Mo.)		3 (range, 0.25-24)
Median time to follow-up (Mo.)		33 (range, 15-81)
Clinical presentation	Proptosis	51 (54.3%)
	Palpable mass	40 (42.6%)
	Eye pain	2 (2.1%)
	Cellulitis	1 (1.1%)
Anatomical location	Orbit	59 (62.8%)
	Conjunctiva	16 (17%)
	Lacrimal gland	14 (14.9%)
	Eyelid	5 (5.3%)
Immunophenotype	B cell	90 (95.7%)
	T/NK cell	4 (4.3%)
Type of lymphoma	Indolent	77 (81.9%)
	Aggressive	17 (18.1%)
Lymphoma subtype	1. Extranodal marginal zone lymphoma (EMZL)	72 (76.6%)
	- with plasmacytic differentiation	- 37/72 (51.3%)
	- with accompanying IgG4 related disease	- 4/72 (5.5%)
	2. Diffuse large B-cell lymphoma (DLBCL)	9 (9.6%)
	3. Mantle cell lymphoma	4 (4.3%)
	4. NK/T cell lymphoma	3 (3.2%)
	5. Follicular cell lymphoma	2 (2.1%)
	6. Small lymphocytic lymphoma	1 (1.1%)
	7. Unclassifiable small B-cell lymphoma	1 (1.1%)
	8. Plasmablastic lymphoma	1 (1.1%)
	9. Peripheral T-cell lymphoma	1 (1.1%)
Ann Arbor staging (total: 89)	I	59 (66.3%)
	II	15 (16.9%)
	III	6 (6.7%)
	IV	9 (10.1%)
Performance status (ECOG) (total: 79)	0	72 (91.1%)
	1	3 (3.8%)
	2	2 (2.5%)
	3	2 (2.5%)
International Prognostic Index (IPI) (total: 74)	Low risk (0-1)	61 (82.4%)
	Low-intermediate risk (2)	5 (6.8%)
	High-intermediate risk (3)	8 (10.8%)
	High risk (4-5)	-
LDH level (total: 75)	Normal	67 (91.8%)
	Higher than upper normal level	6 (8.2%)
HIV status (total: 75)	Positive	3 (4%)
	Negative	72 (96%)
HBV infection (total: 75)	Positive	2 (2.7%)
	Negative	73(97.3%)
HCV infection (total: 75)	Positive	3 (4%)
	Negative	72 (96%)

Abbreviations: ECOG, Eastern Cooperative Oncology Group; HBV, Hepatitis B virus; HCV, Hepatitis C virus; HIV, Human immunodeficiency virus; LDH, Lactate dehydrogenase; NK, natural killer; SD, Standard deviation

TABLE 2. Treatment modalities.

Treatment modalities (total: 64)	64 (68%) from 94 cases
Chemotherapy	42 (67.2%)
Regimen	
- CVP	25 (59.5%)
- CHOP	7 (16.7%)
- R-CVP	2 (4.8%)
- Chlorambucil	5 (11.9%)
- Cyclophosphamide, prednisolone	2 (4.8%)
- R-BAC	1 (2.4%)
Radiotherapy	11 (17.2%)
Surgery	2 (3.1%)
Combined chemotherapy and radiotherapy	7 (10.9%)
- RT + CHOP	2
- RT + CVP	4
- RT + CP	1
Rituximab	1 (1.6%)
Observation	1 (1.6%)

Abbreviations: CHOP, Cyclophosphamide, doxorubicin, vincristine, and prednisolone; CP, Chlorambucil hydrochloride and prednisone; CVP, Cyclophosphamide, vincristine, and prednisolone; R-BAC, Rituximab, bendamustine, and cytarabine; R-CVP, Rituximab, cyclophosphamide, vincristine, and prednisolone; RT, Radiotherapy

TABLE 3. Treatment-outcome assessments.

Lymphoma type	N (total = 79)	ORR (%) (total = 79)	CR (%) (total = 64)	PFS (%)		OS (%)	
Indolent	66 (83.5%)	92.4 % (61/66)	73.1% (38/52)	3 yr – 75.2% 5 yr – 62.8%		3 yr – 96.5% 5 yr – 92.5%	
				CMT (N=34)	RT (N=11)	CMT (N=34)	RT (N=11)
				3 yr – 66.7%	3 yr – 100%	3 yr – 86.4%	3 yr – 100%
				5 yr – 50.1%	5 yr – 100%	5 yr – 78.6%	5 yr –100%
Aggressive	13 (16.5%)	69.2 % (9/13)	50.0 % (6/12)	3 yr – 50.0% 5 yr – 50.0%		3 yr – 65.9% 5 yr – 65.9%	
				CMT (N=8)	No RT cases	CMT (N=8)	No RT cases
				3 yr – 33.3%		only 1 death case	
				5 yr – 33.3%			
Both	79 (100%)	88.6% (70/79)	68.7% (44/64)	3 yr – 70.6% 5 yr – 60.1%		3 yr – 91.6% 5 yr – 84.2%	

Abbreviations: CMT, chemotherapy; CR, complete response rate; ORR, overall response rate; OS, overall survival; PFS, progression-free survival; RT, radiotherapy

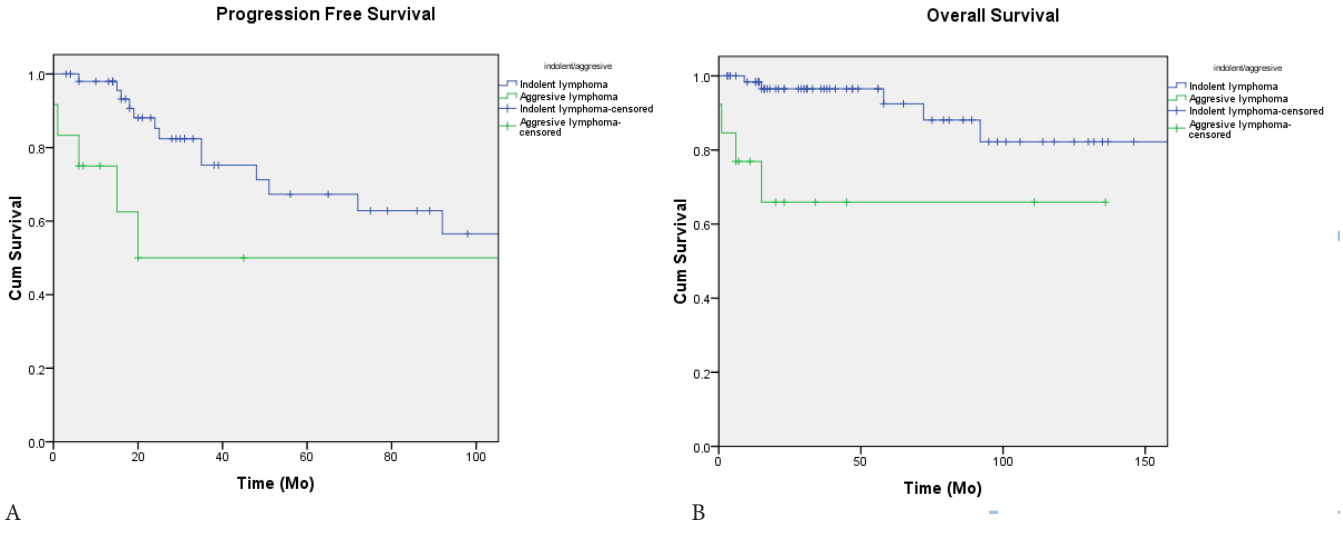

Fig 1. A) Kaplan-Meier progression-free survival (PFS) for the lymphoma subtypes; B) Kaplan-Meier overall survival (OS) for the lymphoma subtypes.

DLBCL (9.6%) and others. This distribution corresponds with other studies. Seresirikachorn et al. from northern Thailand reported EMZL as the most common (85.2%), followed by DLBCL (5.6%) and others.[13] Similarly, Yen et al. reported EMZL as the most common (75.2%), but followed by follicular lymphoma (7.9%) and DLBCL (6.1%).[12] A distinctive finding in our study is the recognition of plasmacytic differentiation in half of EMZL cases (51.4%). This phenomenon is in fact quite common in marginal zone lymphoma and it is expected to see in lymphoplasmacytic lymphoma while it is rare in mantle cell lymphoma.[14] Moreover, in our study, there were 4 cases (5.5%) of EMZL with accompanying IgG4-related disease and 2 of them also showed plasmacytic differentiation. As IgG4-related disease is quite common to produce ocular mass and, recently, a number of cases with ocular adnexal lymphoma of EMZL type have been reported to have accompanying IgG4-related disease.[15] It is possible that a subset of EMZL may arise in IgG4-related disease.[16] The benefit from the detection of plasmacytic differentiation in EMZL and other B-cell lymphomas is that the immunophenotype of restriction to cytoplasmic immunoglobulin light chain (light chain restriction) in the plasma cell component can be used to monitor the disease. For example, if EMZL with plasmacytic differentiation has lambda light chain restriction, evaluation of marrow staging or any subsequent tissue sample can determine whether any lambda light chain restriction exists in the plasma cells. The same light chain restriction in plasma cells as that found in the primary lesion is supportive for involvement by lymphoma.

The treatment of ocular adnexal lymphoma usually depends on its stage and the clinical judgement of the attending physician's. Although irradiation is the treatment of choice for stage I and II localized diseases, it is challenging because of the nearby radiosensitive structures, such as the lens, lacrimal gland, and retina, all of which may be adversely affected by radiation.[17] The majority of cases use radiotherapy either as a stand-alone treatment or in combination with chemotherapy or surgery; however, the present study found that chemotherapy, rather than radiation, was the primary treatment in 67.2% of cases. There are several reasons for this situation. Firstly, as Siriraj Hospital is a tertiary-care hospital, most of the patients were above stage I (33.7%), and many cases had the aggressive lymphoma. Furthermore, the data were collected in a 13-year retrospective period; during that time the radiation therapy was not as effective or safe as at present. Moreover, a long radiation-therapy waiting list coupled with the negative side effects on the local ocular structures would also have influenced physicians to select chemotherapy over radiotherapy. Even though nowadays radiotherapy universally gives very good outcomes for extranodal marginal zone lymphomas[12], the authors still performed the subgroup analysis to compare the outcomes of the extranodal marginal zone lymphoma patients who received chemotherapy versus radiotherapy. Both groups responded well to their treatment modalities, with no statistically significant difference between the outcomes of the two groups ($p = 0.311$).

In this study, the characteristic of lymphoma in terms of its presentation, anatomical location, and subtypes are similar to those found by other studies in Thailand, but with some small differences compared to Western countries (Table 4). When a comparison is made with various studies from Northern Thailand, Asian countries,

TABLE 4. Characteristic and treatment outcome of primary adnexal ocular lymphoma.

Region	Present study	Northern Thailand[13]	Asia[19-21]	Europe[3,22-26]	America[27-33]
No. of participants	94	54	47-114	52-192	48-353
Median Age (yrs)	61.5	61	46-62	58-65	59-68
Female (%)	40.4	57.4	42-57	54-63	37-68
Clinical presentation	Proptosis 54.3% Palpable mass 40%	Palpable mass 75.9% Proptosis 14.8%		Conjunctival lesion 32% Proptosis 27% Palpable mass 19%	Palpable mass 69%
Location of disease	Orbit 62.8% Conjunctiva 17% Lacrimal 14.9%	Lacrimal 46.3% Orbit 31.5% Conjunctiva 13%	Orbit 59-83% Conjunctiva 6-36% Lacrimal 3% Eyelid 1-8%	Orbit 40-69% Conjuncitva 17-36% Lacrimal 19% Eyelid 4-18%	Orbit 47-59% Conjunctiva 25-64% Lacrimal 20-25% Eyelid 10-24%
Lymphoma subtype	EMZL 76.6% DLBCL 9.6% MCL 4.3% NK/T 3.2% FL 2.1% SLL 1.1% PBL 1% PTCL 1% BL 2.1%	EMZL 85.2% DLBCL 5.6% PTCL 5.6%	EMZL 81-87% DLBCL 3-11% MCL 6.4%	EMZL 36%-88% LPL 23% FL 6-14% Immunocytoma 9% PTCL 1% B-LBL 1%	EMZL 57-89% FL 12-25% DLBCL 3-14% CLL/SLL 3-23%
Primary treatment type	CMT 67.2% RT 17.2%	RT 50% CMT 31.6%	RT 51-100% CMT RT+CMT	RT 68-100% RT+CMT 25%	RT 34-100% CMT 12-32%
Median F/U (yrs) PFS	2.75 LG 3 yr – 75.2% HG 3 yr – 50%	N/A LG 3 yr – 69.9% HG 3 yr – 42.9%	3.8-6.2 EFS 5 yr – 75-96%	4.4-9.9 EFS 5 yr MALT 73.6-88% EFS 5 yr LG - 68% EFS 5 yr HG 43-52%	2.7-6.8 5 yr – 55.9-97% LG 5 yr - 78% HG 5 yr - 50%
OS	LG 3 yr – 96.5% HG 3 yr – 65.9%	LG 3 yr – 92.5% HG 3 yr – 42.9%	5 yr – 89-96%	LG 5 yr - 78% HG 5 yr – 50%	5 yr – 69-98

Abbreviations: B-LBL: B lymphoblastic lymphoma, BL: Burkitt lymphoma, CLL/SLL: chronic lymphocytic leukemia/small lymphocytic lymphoma, CMT: chemotherapy, CR: complete response rate, DLBCL: diffuse large B-cell lymphoma, EMZL: extranodal marginal zone lymphoma, EFS: event-free survival, FL: follicular lymphoma, HG: high grade, LG: low grade, LPL: lymphoplasmacytic lymphoma, MCL: mantle cell lymphoma, NK/T: NK/T-cell lymphoma, OS: overall survival, PBL: plasmablastic lymphoma, PFS: progression free survival, PTCL: peripheral T-cell lymphoma, RT: radiotherapy, SLL: small lymphocytic lymphoma

and Western countries where radiation has been used as the primary treatment, the PFS and OS results of the current investigation are not markedly different (Table 4). Analysis of the low-grade or indolent lymphoma group found a better prognosis than the high-grade or aggressive lymphoma subtype (5-year OS, 92.5% vs 65.9%; and 5-year PFS, 62.8% vs 50%, respectively). Yen et al. reported that the 5- and 10-year disease-free survival rates for EMZL (884 patients) were 86.4% and 78.7%, and that the 5- and 10-year OS rates were 93.8% and 84.9%, respectively.[12] In lymphoma other than EMZL (988 patients), the 5- and 10-year disease-free survival rates were 75.7% and 71.0%, and the 5- and 10-year OS rates were 78.9% and 73.5%, respectively.[12] EMZL is the most common type found in the orbit, and it generally shows the best prognosis. Follicular lymphoma patients usually have good long-term survival prospect. DLBCL shows an aggressive natural history but responds well to chemotherapy, whereas mantle cell lymphoma is usually very aggressive and often fatal.[23]

There were a number of limitations in our study. Firstly, it was a retrospective study, and many patients had been referred back for treatment by other hospitals; thus, complete data could not be elicited. Moreover, there were few cases of radiation therapy compared to the other treatment modalities, and only a small number of aggressive lymphomas. In order to evaluate the potential etiologic factors, a systematic, multicenter effort would therefore be needed to collect a large enough sample size. Further studies are needed to better understand each type of lymphoma, especially the aggressive type, which shows inferior survival rate.

CONCLUSION

Primary ocular adnexal lymphoma patients at Siriraj Hospital mostly presented with proptosis with an orbital lesion. Extranodal marginal zone lymphoma with an early stage and low ECOG was the most common subtype. Chemotherapy was still the main treatment utilized for both the indolent and aggressive lymphomas, in which the indolent group demonstrates better overall and complete response rates than the aggressive group. The histopathological subtype and clinical stage are the two best indicators of prognosis and treatment outcomes.

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