Primary Gastric Lymphoma Types and Pathological Pattern: A Tertiary Hospital Experience

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ABSTRACT

Background: Primary gastric lymphoma (PGL) is the commonest form of extranodal lymphomas of the gastrointestinal tract. The majority are B-cell non-Hodgkin lymphomas. The most common type is diffuse large B-cell lymphoma (DLBCL) followed by marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT). The aim of this study is to determine the prevalence, classification and pathological pattern of primary gastric lymphoma in comparison with other gastric malignancies and to compare the results with that observed worldwide.

Methods: A retrospective cohort study of PGL diagnosed at King Abdulaziz Medical City, National Guard Health Affairs, Riyadh, Saudi Arabia between the years 2013 and 2018. Data will be presented as mean + standard deviation for continuous variables, and frequencies (percentages) for categorical variables.

Results: PGL represents 30% of all gastric malignancies with mean age of 64.2 years and slight male predominance. DLBCL is the commonest type (72.2%) followed by MALT lymphoma (14%), anaplastic large cell lymphoma (5%), peripheral T-cell lymphoma, NOS (3%), mantle cell lymphoma (3%) and plasmacytoma/myeloma (3%). 86.7% show association with gastritis, however, H. pylori is observed in 23.5% of PGL with majority being with DLBCL and only 1 case of MALT lymphoma.

Conclusion: PGL is the second commonest malignancy of the stomach where most of the cases are DLBCL followed by MALT lymphoma. There is no difference observed in relation to age and sex compared with those observed in the literature. Further analysis is recommended to evaluate the association with H. pylori in our population.

Keywords: Primary gastric lymphoma, MALT lymphoma, Stomach

BACKGROUND

Lymphoma is a monoclonal malignant proliferation of lymphoid cells. It may arise from lymph node or extranodal lymphoid tissue. In general, it is divided into two main types, Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL) in which the NHL is more common (60%) and more aggressive[1]. NHL is frequently nodal and difuse, however, extranodal involvement is not uncommon. It may occur with leukemic phase that is not seen in Hodgkin disease[1]. The incidence of Non-Hodgkin lymphoma has been increasing around the world for both men and women[2]. Furthermore in Saudi Arabia, it is the second most common type of cancer in males and the fifth in females[3]. NHL is further categorized based on the cell type, growth pattern, cell size, surface marker expression and cytogenetic translocations[1]. It encompasses a different group of solid tumors which occur with malignant transformation and growth of B or T lymphocytes or its precursors.1 The majority of the neoplastic transformations are B origin which accounts for 85%, whereas the other 15% are T origin with some geographical variations[1]. There are more than 100 different subtypes of NHL, and they often arranged as small, intermediate or large cells.1 Small B-cell category consists mainly of follicular lymphoma (FL), mantle cell lymphoma (MCL), small lymphocytes lymphoma (SLL), lymphoplasmacytic lymphoma (LPL) and marginal zone lymphoma (MZL).1 MZL is a neoplastic proliferation of marginal zone B cells. It includes extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue (MALT), nodal MZL and splenic MZL.1 With 9% prevalence, MALT lymphoma is the third most common subtype of mature B-cell lymphomas after diffuse large B-cell lymphoma (DLBCL) (37%) and FL (29%). The stomach is the most common primary location of MALT lymphoma and it accounts for 43%[2,4].

Extranodal lymphomas are most commonly seen in the gastrointestinal tract (up to 40%). Stomach is considered the most common site involved (60%)[5,6]. Primary gastric lymphoma (PGL) can originate as extranodal MALT lymphoma which is a low-grade tumor with strong relation to Helicobacter pylori infection or it can be an aggressive form like DLBCL, peripheral T-cell lymphoma or anaplastic large cell lymphoma among others[5,7,8.] DLBCL in particular is more common and can arise de novo or as transformation from low-grade type like MALT lymphoma[1,5,7].

In Middle-East including Saudi Arabia there are only few published data that studied this tumor and its clinical and pathological

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characteristics[9-16]. It is important to analyze this type of tumor and to study the associated clinical and pathological factors to help in the understanding of this tumor and assist in the management approach and plan.

The aim of this study is to overcome such shortage of local data documentation and to determine the prevalence, classification and pathological pattern of primary gastric lymphoma in comparison with other gastric malignancies and to compare the results with that observed worldwide.

METHODS

This is a retrospective cohort study in which charts of all patients diagnosed with primary gastric lymphoma between Jan 2013 to Sep 2018 were reviewed. The diagnosis in all these cases was initially reported by certified anatomic pathologists then was re-evaluated by the principal investigator who is certified hematopathologist to ensure accuracy of diagnosis. The study was conducted in the department of Pathology and Laboratory Medicine, King Abdulaziz Medical City, National Guard Health Affairs, Riyadh, Saudi Arabia in which electronic records in addition to histological materials of those patients were reviewed and the needed information including patient's age, gender, tumor location, tumor type (morphology and phenotype), presence of gastritis, presence of helicobacter pylori organisms and presence of intestinal metaplasia was extracted and tabulated for statistical analysis. Cases of lymphoma with secondary involvement of stomach were excluded. Hematoxylin and Eosin (H&E) and immunohistochemical (IHC) stained slides of the cases were retrieved and re-evaluated microscopically by the primary investigator who is a certified hematopathologist to confirm the diagnosis and re-classify them when needed.

DATA ANALYSIS

Data will be presented as mean + standard deviation for continuous variables, and frequencies (percentages) for categorical variables. A 95 % confidence interval used to assess the prevalence compare categorical data (such as age, gender, anatomical location involved, number of masses, confidence intervals (CI) will be expressed relative to a reference baseline category. A p-value Data will be presented as mean + standard deviation for continuous variables, and frequencies of primary gastric lymphoma and its

variables. The chi-squared test or Fisher's exact test will be used to macroscopic and microscopic features of primary gastric lymphoma). Odds ratios (OR) with 95 % (<0.05) is assumed statistically significant. All analysis of data will be conducted using the SPSS database (IBM SPSS Statistics, SPSS Inc. Chicago IL.

RESULTS

Our patient population was analyzed as part of a larger group including patients with all types of gastric cancers (n=120 patients). Of these, 67.5% (n=81) had adenocarcinoma, 30.0% (n=36) had primary gastric lymphoma (PGL), 1.6% (n=2) had GIST and 0.8% (n=1) had a neuroendocrine tumor (Figure 1). Amongst these, 115 participants reported sex (n=65 males; n=50 females). Neither age nor sex was predisposed to PGL in comparison to other gastric malignancies (p=0.503). Only 49 of the participants reported H. Pylori status. There was no significant difference in the prevalence of H. Pylori in patients with PGL, when compared to patients with other types of gastric cancers (p=0.101).

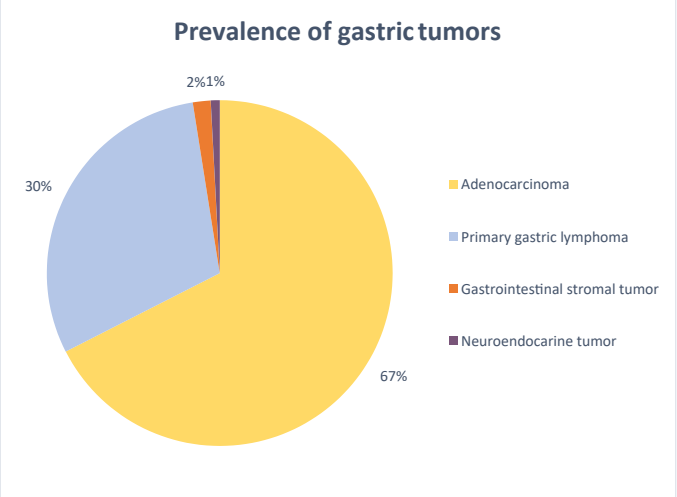

Figure 1: Prevalence of gastric tumors

PGL Patient Characteristics: PGL sample population consisted of 36 participants; between the ages of 34 and 90 years (mean age = 64.2 years; SD= 14.4 years). Amongst these, 61.1% were males (n=22, mean age = 64.5 years; SD = 15.2 years) vs 38.9% females (n=14, mean age = 63.4 years; SD= 15.2 years). There was no significant difference in age between males and females with PGL (p=0.775). The most common site of PGL was the Antrum (83.3%), followed by the body (13.3%) and then the fundus (3.3%). Majority of the participants were Saudi nationals (n= 32; 89.0%). In our sample population, 23.5% (n=8 out of 34 reported) were positive for H. Pylori (7 DLBCL, 1 MALT lymphoma), 86.7% (n=31) had gastritis and only 6.3% (n=2) were found to have intestinal metaplasia.

Types of PGL: Majority of the PGLs were of diffuse large B-cell lymphoma type (DLBCL) (n= 26; 72.2%), followed by MALToma (n=5; 14%). Figure 2 outlines in detail the proportion of different types of PGL. Gender of the participants was not significantly associated with the likelihood of having DLBCL (p=0.497) or MALToma (p=0.810). Similarly, there was no significant association between DLBCL/MALToma and the presence of gastritis (p DLBCL=0.348; p MALToma=0.933), H. Pylori (p DLBCL=0.385; p MALToma=0.592) or intestinal metaplasia (p DLBCL=0.477; p MALToma=0.440).

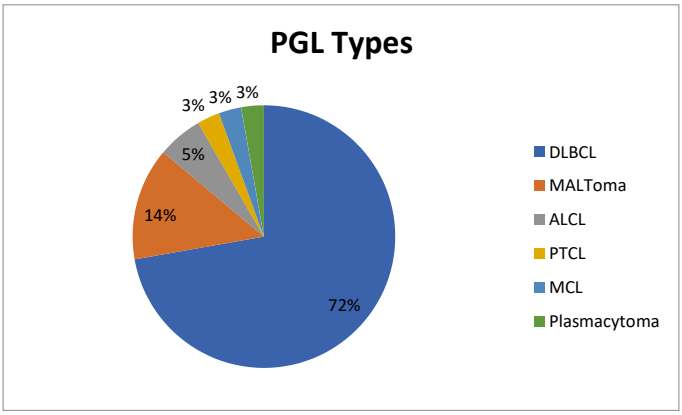

Figure 2: Prevalence of primary gastric lymphoma types

In regard to DLBCL, subtyping to germinal center (GC) versus activated B-cell (ABC) types was available for 23 cases. There is no significant difference between them (12 cases (52%) were GC and 11 cases (48%) were ABC).

In addition, two cases of DLBCL (8.3%) showed coexistence with MALToma indicating the possibility of transformation.

DISCUSSION

In our study, PGL is the second commonest primary gastric malignancy after adenocarcinoma. Similar to other local and worldwide studies, DLBCL is the commonest PGL subtype followed by MALT lymphoma.[2-16] There is slight male predominance and mean age of 64.2. H. pylori id identified in 23.5% of PGL where the majority are DLBCL. Only one case (20%) of MALT lymphoma shows H. pylori which is very low frequency compared with (75%) reported in the literature[2,15]. This observation may be explained by the low sample number in our study or may indicate other possible pathogenesis which require further analysis. Two cases of DLBCL show coexistence with MALT lymphoma which may indicate transformation.

Our study also shows stomach can be involved by other types of lymphoma than B-cell lymphoma. Two cases of anaplastic large cell lymphoma, one case of peripheral T-cell lymphoma, NOS and one case of plasmacytoma/myeloma. This heterogeneous group of hematolymphoid malignancies involving the stomach is observed in most of studies in the literature.

Comparing PGL with the commonest malignancy of the stomach i.e., adenocarcinoma, our study shows no significant difference between them in association with patient age, sex or H. pylori.

CONCLUSION

In summary, PGL is the second commonest malignancy of the stomach where most of the cases are DLBCL followed by MALT lymphoma. There is no difference observed in relation to age and sex compared with those observed in the literature. Further analysis is recommended to evaluate the association with H. pylori in our population.

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