Review Article

A review of recent publications on haematolymphoid neoplasms in the head and neck region

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ABSTRACT

Head and neck haematolymphoid neoplasms are a heterogeneous group of malignancies that pose diagnostic and therapeutic challenges. They consist of a range of lymphomas, leukaemias, plasmacytomas, and histiocytic disorders that occur in such sites as the oral mucosa, oropharynx, cervical lymph nodes, and jawbones. This systematic review describes the epidemiology, clinical presentation, histopathology, diagnostic methods, and treatment of haematolymphoid neoplasms of this region. A systematic literature search of relevant databases was conducted to evaluate current knowledge and recent advances. The review highlights the current subtypes, the diagnostic utility of histopathology and molecular markers, and the evolving pattern of targeted and immunotherapeutic approaches.

Keywords: haematolymphoid neoplasms, malignancies, head and neck, review

Introduction

Haematolymphoid neoplasms are a heterogeneous collection of neoplasms of lymphoid and myeloid cell origin, which commonly present in the head and neck regions. The tumours involve organs and tissues like lymph nodes, oropharynx, and oral cavity. Their unpredictable clinical behaviour, which tends to overlap with other neoplastic and non-neoplastic conditions, poses enormous diagnostic challenges. Early and clear diagnosis is essential in order to provide suitable treatment and better outcomes.[1]

Major head and neck haematolymphoid malignancies are extranodal natural killer (NK)/T-cell lymphoma, diffuse large B-cell lymphoma (DLBCL), classical and nodular lymphocyte-predominant Hodgkin's lymphoma, Burkitt lymphoma, follicular lymphoma, mantle cell lymphoma, and marginal zone (MALT) lymphoma. Some unusual conditions such as follicular dendritic cell sarcoma, plasmablastic lymphoma, Langerhans cell histiocytosis, and extramedullary myeloid sarcoma also contribute to diagnostic as well as therapeutic difficulty.[2]

Advances in histopathological and molecular diagnosis have improved diagnostic precision, enabling better classification and prognostic assessment. The combination of imaging modalities such as PET-CT and MRI has also been helpful in staging and surveillance of disease. Targeted therapies and immunotherapeutic modalities have also altered therapeutic paradigms, improving survival in aggressive and indolent haematolymphoid malignancies.[3] This review describes the epidemiology, clinical presentation, diagnostic workup, and treatment modalities for haematolymphoid neoplasms of the head and neck.

Method

A systematic literature search was conducted across the following databases: PubMed, Scopus, Embase, Web of Science, and Cochrane Library, covering publications from January 2000 to 2024.

Search terms included combinations of: "head and neck," "haematolymphoid neoplasms," "lymphoma," "leukaemia," "plasmacytoma," "histiocytic disorders," "oral cavity," "oropharynx," "cervical lymph nodes," "jawbone," "histopathology," "immunohistochemistry," "molecular markers," "treatment," "epidemiology," "clinical presentation."

Boolean operators (AND/OR) and Medical Subject Headings (MeSH) were used to refine the search.

Inclusion Criteria

Studies were included if they met the following criteria:

- Population: Human subjects diagnosed with haematolymphoid neoplasms localized in the head and neck region (oral cavity, oropharynx, salivary glands, cervical lymph nodes, jawbones).
- Study focus: Addressed epidemiology, clinical presentation, diagnostic methods, histopathology, immunophenotyping, molecular diagnostics, or treatment (including chemotherapy, immunotherapy, radiotherapy, or targeted therapy).
- Study design: Original research articles, retrospective/prospective cohort studies, case series (≥5 cases), and systematic reviews.
- Language: Published in English.
- Time frame: Published between January 2000 and May 2025.
- Availability: Full-text accessible.

Exclusion Criteria

Studies were excluded if they met any of the following:

- Focused solely on non-head and neck haematolymphoid neoplasms or metastatic lesions from other sites.
- Case reports (<5 cases), editorials, letters to the editor, abstracts only, conference proceedings, or opinion pieces.
- Animal studies or in vitro studies without clinical correlation.
- Studies lacking clear diagnostic criteria or without histopathologic or molecular confirmation of diagnosis.
- Articles not published in English or without full-text availability.

Results

See details in the table 1.

Discussion

Epidemiology

Haematolymphoid neoplasms are responsible for a considerable percentage of head and neck cancers. Of these, non-Hodgkin's lymphoma (NHL), with a predominance of DLBCL, represents most of the cases. Hodgkin lymphoma is less common but should be considered in a differential diagnosis in young adults who present with cervical lymphadenopathy. Zheng et al. (2023) [12] compared the distribution and survival of primary haematolymphoid neoplasms in elderly patients using a population-based study, with a focus on the dominance of NHL, most notably DLBCL. Their results stressed the impact of patient age, comorbidities, and treatment types on survival outcomes. The survival rate was compromised among elderly patients with aggressive histologic subtypes, underscoring the importance of appropriate individualized therapeutic strategies in accordance with age-related factors and general health status.

Clinical Presentation

Symptoms depend on the location. Painless cervical lymphadenopathy, masses in the oral or oropharynx,

Table 1. An overview of recent publications on haematolymphoid neoplasms

Author	Journal	Study Topic	Sample Size	Key Findings
Iguchi et al. (2012)[4]	Acta Oto-Laryngologica	Anatomic distribution of haematolymphoid malignancies in the head and neck: 7 years of experience with 122 patients in a single institution.	122	Predominance of NHL in oropharynx and nasopharynx; 80% B-cell lymphomas, mostly DLBCL; male:female ratio 2.3:1; median age 66 years; common sites: oropharynx (36.1%), cervical lymph nodes (34.4%)
Takano et al. (2015)[5]	Acta Oto-Laryngologica	Site-specific analysis of B-cell non-Hodgkin's lymphomas of the head and neck: A retrospective 10-year observation.	153	B-NHL most commonly affects oropharynx (40.5%) and cervical lymph nodes (33.3%); 71.9% were DLBCL; median age 68 years; male:female ratio 1.64:1
Seo et al. (2023)[6]	Journal of Rhinology	A case of extramedullary plasmacytoma in both maxillary sinuses.	1 (Case Study)	EMP involving both maxillary sinuses; post-MM complete remission; treated successfully with radiotherapy (50 Gy); no recurrence after 12 months
Kusuke et al. (2019)[7]	European Archives of Oto-Rhino-Laryngology	Oral lesion as the primary diagnosis of non-Hodgkin's lymphoma: a 20-year experience from an oral pathology service and review of the literature.	98	Oral NHLs accounted for 0.1% of biopsies; mean age 47 years; most common types were DLBCL (42%) and plasmablastic lymphoma (24%); nodular lesions frequent (54.9%); pain in 47.1% of cases
Werder et al. (2010)[3]	Quintessence International	Non-Hodgkin lymphoma of the Waldeyer's ring: clinicopathologic and therapeutic issues.	-	Commonest histology was DLBCL; high association with gastrointestinal involvement; combined chemotherapy and radiotherapy improved survival outcomes
Wang et al. (2013)[9]	The Journal of Laryngology & Otology	Characteristics and prognostic factors for head and neck non-Hodgkin's lymphoma in Chinese patients.	102	DLBCL most common subtype; high incidence of T-cell lymphomas; tonsil most frequent site; rituximab with chemotherapy improved survival; prognosis linked to International Prognostic Index and histological subtype
Lee et al. (2014)[10]	The Korean Journal of Internal Medicine	Consortium for Improving Survival of Lymphoma. Clinical characteristics, pathological distribution, and prognostic factors in non-Hodgkin lymphoma of Waldeyer's ring: nationwide Korean study.	328	DLBCL most common subtype (73.2%); tonsils were most frequently involved; T-cell subtype, age ≥ 62, and failure to achieve complete remission were significant poor prognostic factors
Lv et al. (2024)[11]	Aging	Clinical characteristics and prognostic analysis of primary extranodal non-Hodgkin's lymphoma of the head and neck.	74	Waldeyer's ring most common site; DLBCL most prevalent subtype; radiotherapy + chemotherapy more effective than chemotherapy alone; prognosis linked to ECOG score, Ann Arbor stage, and IPI risk stratification

nasal obstruction, and systemic B symptoms (fever, night sweats, and loss of weight) are common presentations. Su et al. (2023)[13] reviewed 369 cases of oral and maxillofacial NHL, describing clinicopathological features and their influence on prognosis. The findings supported that early detection and histopathologic examination significantly increased survival. The aggressive subtypes of patients, for example, plasmablastic lymphoma, had unfavourable outcomes. This follows the overall evidence that the aggressive histological subtypes are the ones requiring rigorous therapeutic regimes and vigilant monitoring to achieve maximum prognosis. Moreover, their conclusion promotes the integration of molecular diagnosis with imaging technology for early detection and personalized management practices.

Histopathology and Immunophenotyping

Diagnosis is based on histopathological investigation supported by immunohistochemical staining for lineage-restricted markers (e.g., CD20 for B-cell neoplasms, CD3 for T-cell neoplasms). Molecular analysis, including fluorescence in situ hybridization (FISH) and polymerase chain reaction (PCR), assists in the identification of genetic abnormalities important for risk stratification. Iguchi et al. (2012)[4] and Takano et al. (2015)[5] carried out site-specific investigations of haematolymphoid malignancies, demonstrating that oropharynx and nasopharynx were the most affected sites, largely impacted by B-cell NHL, especially DLBCL. Their results highlighted the importance of anatomical site specificity in making prognostication and treatment planning.

Imaging and Diagnostic Modalities

Imaging procedures like PET-CT and MRI have pivotal roles in the staging of diseases and in monitoring treatment response. PET-CT is especially useful in differentiating true lymphomatous involvement from reactive lymphadenopathy. Seo et al. (2023)[6] documented a case of extramedullary plasmacytoma involving both maxillary sinuses, highlighting the vital role played by PET-CT in separating true lymphomatous involvement from reactive change. Their investigation further proved that a successful outcome after early diagnosis by proper radiotherapy resulted in no recurrence upon follow-up for 12 months.

Current Management Strategies

- **Chemotherapy:** R-CHOP continues to be the first-line regimen for aggressive B-cell lymphomas, whereas ABVD is the first-line regimen for Hodgkin's lymphoma. Laskar et al. (2008)[8] and Wang et al. (2013)[9] evaluated prognostic indicators in head and neck NHL. Laskar et al.[8] concluded that the combination of chemotherapy and radiotherapy provided improved survival rates compared with monotherapy. Wang et al.[9] documented rituximab combined with chemotherapy to improve dramatically survival rates, with prognosis having a close relationship with International Prognostic Index scores and histological subtypes.
- **Radiotherapy:** Often employed in localised disease or as an adjuvant therapy with chemotherapy.
- **Targeted Immunotherapy:** Rituximab and monoclonal antibodies have given improved outcomes in B-cell lymphomas. CAR-T cell therapy and checkpoint inhibitors are revolutionizing the treatment in refractory disease. Lee et al. (2014)[10] had retrospectively examined 328 NHL cases of Waldeyer's ring and observed advanced age, failure to achieve complete remission, and T-cell subtype to be independent factors of poor prognosis. Their findings indicate the importance of precise histopathological study and individualized treatment.
- **Surgical Intervention:** Surgical options are constrained by the availability of specialized surgeons and facilities. In cases where surgery is feasible, it is primarily used for diagnostic biopsies or debulking of tumours. Comprehensive surgical management is often not possible due to infrastructural limitations.

Diagnostic Challenges

Accurate diagnosis is hindered by limited access to advanced diagnostic tools such as immunohistochemistry and molecular testing. This often leads to misdiagnosis or delayed diagnosis, adversely affecting treatment outcomes. Efforts are being made to improve diagnostic capabilities through telepathology and training programmes.[14]

Supportive Care and Multidisciplinary Approach

Supportive care services, including nutritional support and psychosocial counselling, are minimal. The implementation of multidisciplinary teams, which is standard in high-resource settings, is challenging due to staffing shortages and lack of coordinated care pathways. Nonetheless, there is a growing recognition of the importance of such approaches, and initiatives are underway to establish tumour boards and collaborative care models.

Challenges and Opportunities

- Late Presentation: Patients often present with advanced-stage disease due to lack of awareness and limited access to healthcare facilities.
- Resource Constraints: Financial limitations affect both the healthcare system's capacity and patients' ability to afford treatment, leading to suboptimal care.
- Training and Retention: There is a need for training programs to build local expertise and retain healthcare professionals in the region.
- Policy Development: Establishing national cancer control programs can provide a framework for improving cancer care services.[15]

Conclusion

Haematolymphoid neoplasms of the head and neck pose special diagnostic and therapeutic challenges. Rapid progress in molecular pathology, imaging studies, and targeted therapy has significantly enhanced patient outcome, but continued investigation is necessary to enhance treatment algorithms. Multidisciplinary management is essential for maximizing disease control and prognosis.

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