Clinicopathological Analysis of Neck Masses in the Iraqi Population: A Ten-Year Retrospective Study

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ABSTRACT

Objective: This study aims to investigate the epidemiological characteristics of neck masses (NMs) in the Iraqi population over a ten-year period (2010-2020), including their prevalence, demographics, and clinicopathological features.

Background: NMs encompass a wide range of pathologies, and precise diagnosis is crucial for optimal management. While international studies have addressed NMs, our research specifically focuses on the Iraqi population.

Methods: A retrospective study was conducted in Baghdad, Iraq, from January to March 2022. Data from a decade (2010-2020) were collected from various institutions, and diagnoses were reevaluated. SPSS version 23 facilitated descriptive analysis.

Results: The study included 301 NM cases, with a balanced gender distribution and a mean age of 32.2 years. NMs were categorized into congenital (25.9%), inflammatory (22.3%), and neoplastic (51.8%) groups. Benign tumors were more common (62.8%) than malignant ones (37.2%). Notable findings included the prevalence of lipomas and squamous cell carcinoma.

Conclusion: This study enhances our understanding of NMs in the Iraqi population. Early detection and intervention are crucial, and while the study has provided valuable insights, nationwide surveys and prospective research are recommended for further advancement.

Key words: Neck masses, Epidemiology, Iraqi population, Clinicopathological analysis, Congenital disorders, Inflammatory lesions, Neoplastic tumors, Benign neoplasms, Malignant neoplasms.

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INTRODUCTION

The neck is defined as the region between the clavicle bone and the lower margin of the mandible. Anatomically, the neck consists of skin, fascia, muscle, blood vessels, lymphatic system components, and nerve fibers. The neck region also contains vital structures, including the thyroid and parathyroid glands, the trachea, and the esophagus [1]. The neck region is divided by the sternocleidomastoid muscle into two triangles (anterior and posterior). The Neck Mass (NM) is an abnormal growth found at any point in the area that extends from the base of the skull to the clavicular bone. NM belongs to one of three main categories of disorders: congenital, inflammatory, and neoplastic lesions. Worldwide, the neck mass with primary malignancy features or metastasis cancer is mostly found in individuals over 40 years of age, while the other categories are found in individuals less than 40 years of age [2]. To confirm the diagnosis and choose the best treatment, clinical features, radiographs, and histopathological examinations are required. The data from the epidemiological studies could help the specialists improve their management of the NM.

Previous research on the epidemiology of neck masses in Iraq is notably lacking. Consequently, this current investigation adopts a cross-sectional approach to delineate the incidence and distribution of various pathologies within the neck region among the Iraqi populace, with specific attention to age and gender correlations. Globally, research exploring the epidemiological aspects of neck masses is relatively limited, with only eleven studies identified that have delved into this topic. These studies were from Turkey [3], Unites States [4], India [5], Pakistan [6], Saudi Arabia [7], Tanzania [8], and Nigeria. [9], Iran [10] Jordan [11]. For these reasons and to achieve the aims of our study, we analyze 301 oral and maxillofacial biopsies in Iraqi people compute their prevalence relative to age and gender and compare the results with those previous studies.

METHODS

Study Design

This study encompassed a retrospective, cross-sectional design, undertaken between January 3, 2022, and March 3, 2022, in the city of Baghdad, Iraq. It sought to analyze data spanning a decade, from 2010 to 2020, extracted from the archives of histopathological laboratories affiliated with prestigious institutions, including the College of Dentistry at the University of Baghdad, Shahid Ghazi Hariri Hospital, Baghdad Medical City, and Al Kadhimiya Teaching Hospital.

Data Collection

The data acquisition process involved the systematic retrieval of pertinent information from medical records. The key variables of interest included patient age, sex, and the primary diagnosis associated with each neck mass. In order to ensure the utmost diagnostic precision, all previously established diagnoses underwent rigorous reevaluation through the meticulous examination of hematoxylin and eosin-stained histopathological slides.

Statistical Analysis

Data analyses were conducted employing the Statistical Package for the Social Sciences (SPSS) software, version 23. The analytical approach predominantly featured descriptive statistical techniques to gain a comprehensive understanding of the demographic and clinicopathological characteristics of the neck masses under scrutiny. This encompassed the generation of summary statistics, such as frequencies, percentages, means, and standard deviations, to facilitate the interpretation and presentation of the results. The data were systematically organized and tabulated to support comprehensive assessment and the identification of meaningful trends and patterns within the dataset.

RESULTS

Demographic and Clinicopathological Characteristics

During the ten-year study period, a total of 301 cases of neck masses (NMs) were identified, with an equitable distribution between genders. Specifically, 144 cases (47.8%) were female, while 157 cases (52.2%) were male, resulting in a marginally higher male-to-female ratio of 1.09:1. The mean age of the cohort was 32.2 years.

Categorization of Neck Masses

The NMs were systematically categorized into three primary groups, based on their pathological characteristics and etiology. These categories encompassed inflammatory masses (22.3%), congenital masses (25.9%), and neoplastic masses (51.8%). Within the neoplastic category, benign tumors emerged as the predominant subgroup, accounting for 62.8% of cases, while malignant tumors represented the remaining 37.2% [Figure 1 and Figure 2].

Age-Related Distribution

Inflammatory masses exhibited a notable association with the age group of 41-50 years, with the most prevalent diagnoses including tuberculous lymphadenitis (58.5%), follicular hyperplasia (16.9%), and infected sebaceous cysts (15.4%). Conversely, congenital NMs were more prominently observed among patients under the age of 10, constituting a higher proportion relative to other age groups. The congenital mass subgroup consisted of thyroglossal duct cysts (41.4%), branchial cysts (28.2%), and Lymphangioma (15.4%).

Benign and Malignant Tumors

The benign tumor category predominantly featured lipomas (57%), carotid body tumors (9%), and hemangiomas (7%), collectively representing the majority of benign cases. In contrast, malignant masses were most
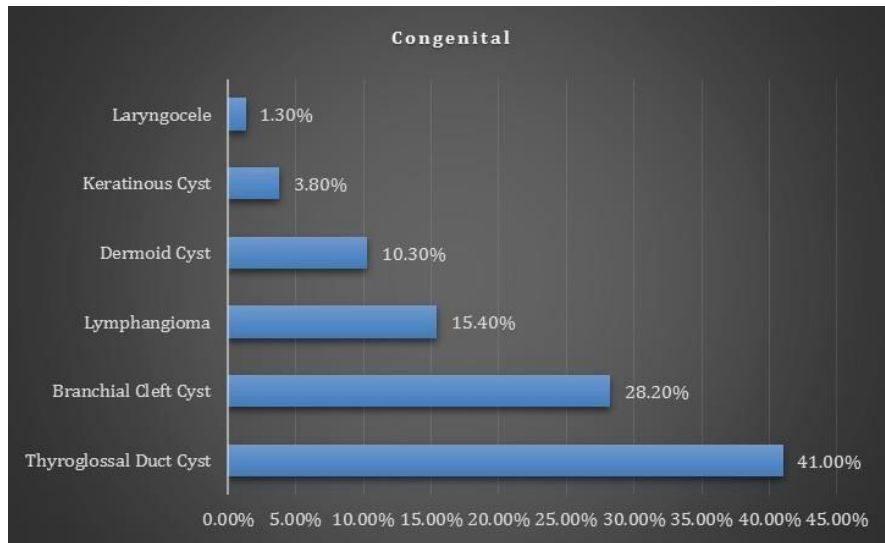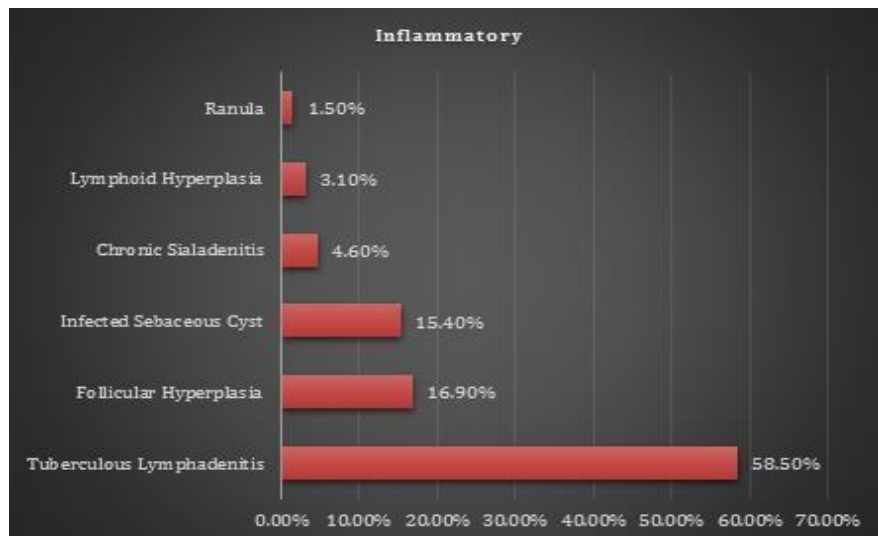
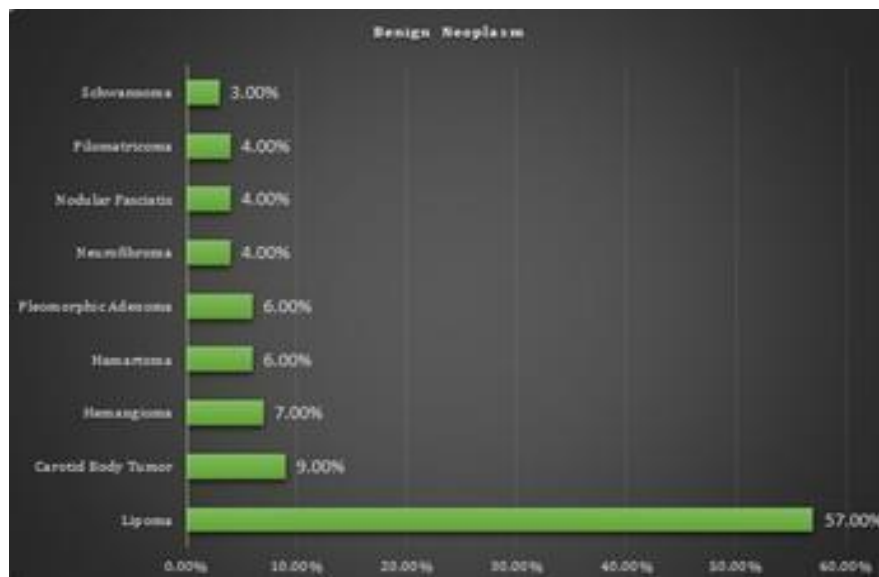**Figue 1: Congenital Lesions.**

Figue 2: Inflammatory Lesions.
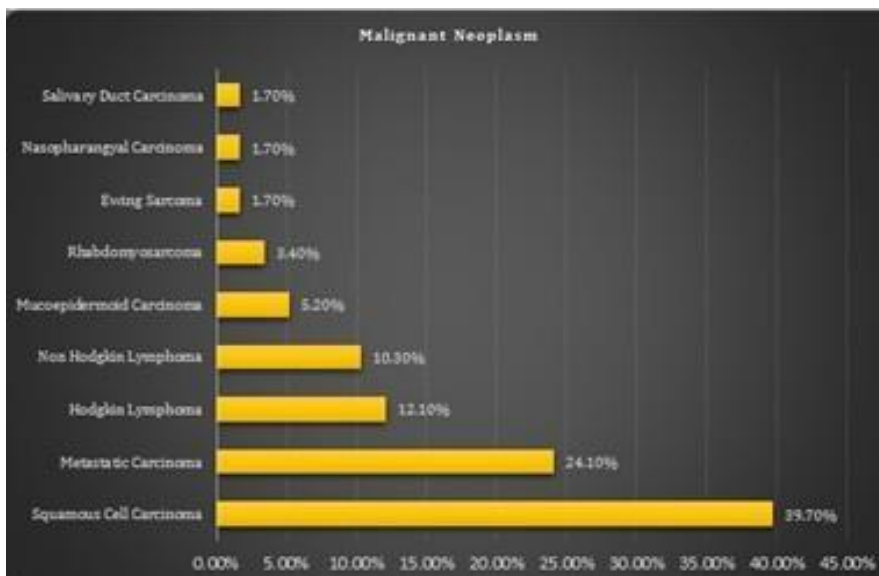

Figure 3: Benign Neoplasm.

Figue 4: Malignant Neoplasm.

Table 1: Final diagnosis within each disease group.

Pathological Category	Subtype	Number of Cases (N)	Percentage (%)
	Thyroglossal Duct Cyst	32	41.00%
	Branchial Cleft Cyst	22	28.20%
Congenital	Lymphangioma	12	15.40%
	Dermoid Cyst	8	10.30%
	Keratinous Cyst	3	3.80%
	Laryngocele	1	1.30%
	Tuberculous Lymphadenitis	38	58.50%
	Follicular Hyperplasia	11	16.90%
Inflammatory	Infected Sebaceous Cyst	10	15.40%
	Chronic Sialadenitis	3	4.60%
	Lymphoid Hyperplasia	2	3.10%
	Necrotizing Fasciitis	2	3.10%
	Ranula	1	1.50%
	Lipoma	57	57.00%
	Carotid Body Tumor	9	9.00%
Benign Neoplasm	Hemangioma	7	7.00%
	Hamartoma	6	6.00%
	Pleomorphic Adenoma	6	6.00%
	Neurofibroma	4	4.00%
	Fasciitis	4	4.00%
	Pilomatricoma	4	4.00%
	Schwannoma	3	3.00%
	Squamous Cell Carcinoma	23	39.70%
	Metastatic Carcinoma	14	24.10%
Malignant Neoplasm	Hodgkin Lymphoma	7	12.10%
	Non-Hodgkin Lymphoma	6	10.30%
	Mucoepidermoid Carcinoma	3	5.20%
	Rhabdomyosarcoma	2	3.40%
	Ewing Sarcoma	1	1.70%
	Nasopharyngeal Carcinoma	1	1.70%
	Salivary Duct Carcinoma	1	1.70%

Note: N denotes the total number of subjects in each category, and percentages are calculated relative to the total number of cases.

frequently observed in individuals aged over 60 years, with squamous cell carcinoma (39.7%) and metastatic carcinoma (24.1%) emerging as the prevailing diagnoses. Notably, benign tumors were primarily identified in the age group of 31-40 years, whereas malignant tumors exhibited a higher incidence among the elderly population. These findings underscore the age-related distribution of neck masses and the distinct pathological characteristics observed within each category [Figure 3 and Figure 4].

Table 1 presents a comprehensive breakdown of the distribution of neck masses based on their pathological categories. This retrospective study, encompassing 301 subjects over a ten-year period, showcases a diverse array of neck mass pathologies encountered in the Iraqi population. The congenital category primarily comprises thyroglossal duct cysts, branchial cleft cysts, and Lymphangioma, representing 41.00%, 28.20%, and 15.40% of the congenital cases, respectively. In the inflammatory group, tuberculous lymphadenitis predominates at 58.50%, followed by follicular hyperplasia (16.90%) and infected sebaceous cysts (15.40%). The benign neoplasm category is characterized by lipomas (57.00%) as the most frequent, along with carotid body tumors (9.00%) and hemangiomas (7.00%). The malignant neoplasm category reveals squamous cell carcinoma as the leading malignancy (39.70%), followed by metastatic carcinoma (24.10%), and Hodgkin lymphoma (12.10%). This detailed categorization offers valuable insights into the diversity of neck mass pathologies and their respective prevalence in the Iraqi population, aiding in the understanding and management of these conditions.

DISCUSSION

Neck Masses (NMs) represent a diverse spectrum of conditions, encompassing inflammatory, congenital, and neoplastic disorders. Accurate diagnosis of NMs hinges on a comprehensive approach, combining a thorough patient history, meticulous clinical examination, radiographic assessments, and the insights gained from laboratory investigations. Epidemiological studies offer invaluable insights not only into the prevalence and distribution of these masses but also in shaping effective diagnostic and treatment strategies.

Our study, in line with previous research, unveiled a higher incidence of NMs in males compared to females [12]. This gender discrepancy may be attributed to an increased prevalence of risk factors among males, including smoking and alcohol consumption. However, it's essential to recognize that exceptions exist, with some studies reporting a higher occurrence of NMs in females.

In our investigation, benign neoplasms took the lead as the most frequent pathological entity in the neck region. This finding mirrors the results of an extensive epidemiological study conducted in India, which involved 4,013 NMs [13]. However, the global landscape of NMs is highly diverse, as evidenced by a study in Brazil, where inflammatory lesions dominated [14].

Furthermore, our findings were consistent with prior research, identifying the thyroglossal duct cyst and tuberculous lymphadenitis as among the most prevalent congenital and inflammatory NMs, respectively. This alignment with previous findings underscores the robustness of these results.

Our study resonates with the work of Balikci and colleagues, who identified lipoma as the most common benign neoplasm leading to neck masses in our study. However, other studies have reported pleomorphic adenoma as the predominant benign neoplasm in the neck region.

Among malignant neoplasms, our investigation recognized squamous cell carcinoma as the most frequently encountered, followed by metastatic carcinoma and various lymphomas, including Hodgkin's and non-Hodgkin's. These findings emphasize the significant clinical diversity within NMs.

It's crucial to acknowledge the limitations of our study, notably its focus on a single city. For more robust and generalizable results, nationwide surveys should be considered. Future research should also prioritize prospective studies, encompassing both clinical and histopathological examinations, to provide deeper insights into the complex landscape of neck masses. These endeavors are essential for advancing our understanding and improving the management of this diverse and clinically significant group of conditions [15].

CONCLUSION

This comprehensive retrospective study of 301 cases of neck masses in the Iraqi population offers significant insights into the epidemiology and clinical characteristics of these conditions. The findings underscore the diversity of neck masses, categorizing them into congenital, inflammatory, and neoplastic groups, thereby contributing to a deeper understanding of their prevalence and distribution in this region. The observed predominance of neck masses in males is noteworthy, possibly associated with lifestyle factors such as smoking and alcohol consumption. Notably, this study aligns with previous research findings while recognizing the exceptions found in the literature. Benign neoplasms emerged as the most common pathological category, particularly lipomas, mirroring trends seen in other international studies. However, the prevalence of malignant neoplasms, particularly squamous cell carcinomas, emphasizes the clinical diversity of neck masses. Despite the significance of these findings, it is essential to acknowledge the limitations of a single-city study. To enhance reliability, future nationwide surveys are warranted. Additionally, prospective research combiningclinical and histopathological assessments is recommended to advance our knowledge of neck masses and enhance their management. Ultimately, this study underscores the need for early detection and intervention for neck masses, thereby optimizing patient outcomes and quality of care.

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