

Original article:

A study of incidence of neck masses among admitted patients of a tertiary care center

¹ Dr Ankit Katara*, ² Dr Snehal Bhangе , ³ Dr Khushboo Shaikh

¹DNB General Surgery 3rd Year Resident, Jaslok hospital, Mumbai

²HOD and Consultant Surgeon, Jaslok hospital

³DNB General Surgery 3rd Year Resident, Jaslok hospital

Corresponding author *



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Abstract:

Objective: This observational cross-sectional study aimed to investigate the incidence, types, and socio-demographic factors associated with neck masses among patients admitted to a tertiary care center.

Methods: A total of 92 patients with neck masses were included in the study. Clinical and histopathological examinations were conducted, and data were analyzed to determine age distribution, gender proportions, types of neck masses, and their relationship with socio-economic status. Statistical analyses, including descriptive statistics and Chi-square tests, were employed.

Results: The mean age of patients was 46.01 years (SD = 18.16). The highest incidence of neck masses occurred in the 4th and 5th decades of life. Malignant neck masses increased with age, reaching 83% in the 7th decade. Infectious neck masses were prevalent across all age groups. Gender distribution showed 56.5% females and 43.5% males presenting with neck masses. Socio-economic analysis revealed 31.52% from low, 34.78% from medium, and 33.70% from high socio-economic classes. Infectious neck masses were more common in low socio-economic groups. The majority (56.5%) presented within 0-3 months of symptom onset.

Conclusion: The most common anatomical site involved with the neck masses was anterior triangle and there was no statistically significant difference in terms of age or sex. Most of the neck masses were found to be malignant and Thyroid malignancy was the leading histological variant followed by lymphoma. Hence neck masses should be taken seriously.

Keywords: Neck masses, malignant, thyroid swelling

Introduction:

Neck masses are a common presenting complaint among patients seeking medical care, often representing a diverse spectrum of underlying etiologies, ranging from benign to malignant conditions. (1) The precise incidence and distribution of neck masses can vary significantly based on factors such as geographical location, demographic characteristics, and access to healthcare resources. Understanding the prevalence and nature of

neck masses is crucial for timely diagnosis, appropriate management, and effective allocation of healthcare resources.(2,3)

When evaluating neck masses, it is important to identify organ of origin, most neck masses found in the neck region are known to arise from the Thyroid, Salivary glands, Lymph nodes, Upper aero-digestive tract, Skin, Soft tissues, etc. Goiter, Koch's and other chronic inflammations, Pleomorphic adenoma, Various cysts and Swellings of skin and subcutaneous tissues comprise the common benign and inflammatory lesions of the neck region.(4,5,6) Nutritional deficiencies, dietary goitrogens, viral and bacterial infections, autoimmune conditions etc, are also responsible for this variety of lesions.(7,8)

This research aims to investigate the incidence and clinical characteristics of neck masses among patients admitted to a tertiary care center. Tertiary care centers play a pivotal role in providing specialized medical services, making them an ideal setting for studying the epidemiology of neck masses and their associated factors. By comprehensively evaluating the demographic, clinical, and pathological aspects of neck masses, this study seeks to shed light on the burden of these conditions within the context of a tertiary healthcare system.(9)

Material and methods:

The present observational cross-sectional study was conducted at JASLOK HOSPITAL AND RESEARCH CENTRE, Mumbai, a renowned 358 bedded Quaternary hospital with a distinguished reputation for surgical advancements and excellence. The study spanned a duration of two years, from August 2020 to August 2022. The primary objective of the study was to investigate the incidence and clinical characteristics of neck masses among male and female patients aged 2 to 90 years.

Utilizing a longitudinal prospective design, the study employed a consecutive sampling technique to recruit participants.

The inclusion criteria encompassed patients presenting with neck masses who were willing to undergo both clinical and histopathological examinations, and who provided informed consent.

Exclusion criteria encompassed cases with prior neck swelling interventions, vascular-origin masses, and those with pus discharge.

The sample size was determined based on a previous study by Barista H, Modwal A et al, which reported that 47% of neck swellings were thyroid swellings in adults. Using a standard formula for sample size calculation, a minimum sample size of 66 was identified. However, during the course of the study, a total of 92 eligible subjects voluntarily participated.(10)

Data collection commenced with a comprehensive clinical assessment, incorporating sociodemographic history, past medical history, and a thorough physical examination. Subsequently, Fine-Needle Aspiration Cytology (FNAC) and histopathological biopsy reports were acquired for each participant's neck mass.

Results:

The study population consisted of 92 patients who presented in hospital with complaints of neck mass. The mean age was 46.01 with standard deviation of 18.16. The youngest patient for study was 3 years old and the oldest was 81 years old. The maximum number of patients presenting with neck mass are mainly between 40-60(4th,5th decade) years of age.

Table 1) Types of Neck Masses in Various Age groups

Malignant neck mass incidence increased with increase in age as 3rd decade - 25%,
 < 4th decade - 46.1%, < 5th decade - 47.3%, < 6th decade – 58.3%, < 7th decade - 83%. Infectious neck
 masses were mainly found in all age groups. (p Value was- 0.423)

| Age groups | Acquired | Congenital | Infectious | Malignant | Malignant + infectious | Total |
|-------------|-----------|------------|------------|------------|------------------------|-------|
| 0-10 years | 1 (5.3%) | 0 | 1 (3.6%) | 0 | 0 | 2 |
| 11-20 years | 2 (10.5%) | 1 (50%) | 2 (7.1%) | 3 (7.1%) | 0 | 8 |
| 21-30 years | 3 (15.8%) | 0 | 3 (10.7%) | 3 (7.1%) | 1 (100%) | 10 |
| 31-40 years | 0.00% | 0 | 6 (21.4%) | 2 (4.8%) | 0 | 8 |
| 41-50 years | 6 (31.6%) | 0 | 8 (28.6%) | 12 (28.6%) | 0 | 26 |
| 51-60 years | 4 (21.1%) | 0 | 6 (21.4%) | 9 (21.4%) | 0 | 19 |
| 61-70 years | 2 (10.5%) | 1 (50%) | 2 (7.1%) | 7 (16.7%) | 0 | 12 |
| 71-80 years | 1 (5.3%) | 0 | 0 | 5 (11.9%) | 0 | 6 |
| 81-90 years | 0 | 0 | 0 | 1 (2.4%) | 0 | 1 |
| Total | 19 | 2 | 28 | 42 | 1 | 92 |

Table 2) Gender Distribution of Patients

Gender distribution of patients found that 56.5% of females and 43.5% of males had presented with neck mass. (p Value was – 0.415)

| Gender | Frequency | Percentage |
|--------|-----------|------------|
| Female | 52 | 56.5 |
| Male | 40 | 43.5 |
| Total | 92 | 100 |

Table 3) Socio-economic Status of Patients (Table-8,9 and Graph- 4)

| Socioeconomic Class | Frequency | Percent |
|---------------------|-----------|---------|
| Low | 29 | 31.52 |
| Medium | 32 | 34.78 |
| High | 31 | 33.70 |
| Total | 92 | 100 |

Socio-economic status of patients were taken in account in terms of Per Capita income of families using Modified B G Prasad scale⁷¹. High SES includes I and II Social class, Medium SES including III social class and Low SES including IV and V social class.

Table 4) Modified BG Prasad Classification for May 2021

| Social class | Per capita income (₹) as per original classification in 1961 | Per capita income (₹) as per modified classification for May 2021 |
|--------------|--|---|
| I | ≥100 | ≥7863 |
| II | 50-99 | 3931-7862 |
| III | 30-49 | 2359-3930 |
| IV | 15-29 | 1179-2358 |
| V | <15 | <1179 |

31.5% cases studied by us were from the Low Socio-economic class, 34.7% cases were from the Medium SES and 33.7% cases were from High SES class

Infectious neck masses were more common in Low SES groups (34.4%) when compared with medium and high SES class. Malignant neck lesions were almost similar in all classes. (**p Value was- 0.99**)

Table 5) Classification

| SES | Acquired | Congenital | Infectious | Malignant | Malignant + infectious | Total |
|--------|-----------|------------|------------|------------|------------------------|-------|
| Low | 5 (26.4%) | 0 | 10 (35.7%) | 14 (33.3%) | 0 | 29 |
| Medium | 7 (36.8%) | 1 (50%) | 8 (28.6%) | 15 (35.7%) | 1 (100%) | 32 |
| High | 7 (36.8%) | 1 (50%) | 10 (35.7%) | 13 (31%) | 0 | 31 |
| Total | 19 | 2 | 28 | 42 | 1 | 92 |

Discussion:

The results of this observational cross-sectional study conducted at JASLOK HOSPITAL AND RESEARCH CENTRE, Mumbai, provide valuable insights into the incidence, characteristics, and socio-economic factors associated with neck masses among a diverse patient population. The study encompassed a total of 92 participants, with a mean age of 46.01 years and a standard deviation of 18.16. The age distribution revealed that the highest number of patients with neck masses were in the 4th and 5th decades of life (40-60 years), highlighting a trend towards increased prevalence during middle age (11, 12)

The investigation into the types of neck masses across different age groups demonstrated a notable increase in the incidence of malignant neck masses with advancing age. This trend was particularly pronounced in the 6th and 7th decades, indicating a higher susceptibility to malignancies among older individuals. Conversely, infectious neck masses were found to be prevalent across all age groups. This observation may reflect the diverse etiologies underlying infectious neck masses, which can range from bacterial infections to viral or fungal origins. The lack of significant p-values in these findings suggests a complex interplay of factors contributing to the distribution of different neck mass types across age groups.

Examining the gender distribution, the study revealed that a slightly higher proportion of females (56.5%) presented with neck masses compared to males (43.5%). This gender difference was not statistically significant (p-value = 0.415). These findings may reflect underlying gender-specific risk factors or differences in healthcare-seeking behaviors, warranting further investigation.

The study's assessment of socio-economic status using the Modified B G Prasad scale provided noteworthy insights into the relationship between socio-economic factors and neck mass presentation. The distribution of cases among low, medium, and high socio-economic classes was relatively balanced, with the majority falling into the medium socio-economic category (34.78%). This distribution suggests that neck masses are not confined to a particular socio-economic group, underscoring the importance of equitable healthcare access and awareness across different strata of society.

Interestingly, the prevalence of infectious neck masses was found to be higher in the low socio-economic group (34.4%) compared to medium (28.6%) and high (35.7%) socio-economic groups. This finding may indicate that factors related to living conditions, hygiene, and access to healthcare services influence the occurrence of infectious neck masses. Malignant neck lesions showed a relatively consistent distribution across socio-economic classes. The lack of significant p-value ($p = 0.99$) in relation to the distribution of neck mass types across socio-economic groups suggests that socio-economic status may not be a major determinant of the type of neck mass.

An evaluation of the duration of complaints revealed that the majority of patients (56.5%) presented with neck masses within a span of 0-3 months. This timely presentation is encouraging and implies a relatively proactive approach to seeking medical attention for neck masses. However, it's important to note that a non-negligible proportion of patients (9.8%) reported a duration of complaint exceeding 1 year, underscoring the need for improved awareness and prompt medical evaluation for persistent neck masses.

Conclusion:

The proportion of malignant neck masses was found to increase as the age increased. The most common anatomical site involved with the neck masses was anterior triangle and there was no statistically significant difference in terms of age or sex. Most of the neck masses were found to be malignant and Thyroid malignancy was the leading histological variant followed by lymphoma. Hence neck masses should be taken seriously. Early assessment including Thyroid gland evaluation with neck lymph node evaluation and biopsy is important to rule out possibilities of malignancies and hence early intervention.

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