

Abstract

Objectives:

- To evaluate the types of neck masses seen in the military recruit population.
- To determine the incidence of medical conditions disqualifying recruits from military training during the evaluation of a neck mass.

Study Design: Retrospective cohort study of all patients evaluated for a neck mass by a combined Navy and Veteran Affairs Otolaryngology clinic from January 1, 2011-September 1, 2014. Military recruits were identified and compared to Veteran Affairs members, active duty (non-recruit) members, and active duty family dependents.

Methods: One-hundred and fifty patients were evaluated during the study period. Electronic medical records were reviewed for all patients. Data collection included demographic information, co-morbidities, pathology, and imaging results.

Results: Of the 150 patients evaluated, 46 (30.7%) were recruits of which, 10 (21.7%) were disqualified from military training. Reactive lymphadenopathy was the most common diagnosis seen in 20 (43.5%) recruits followed by neck infection (15.2%), congenital neck mass (15.2%), benign soft tissue lesion (8.7%), and malignancy in 3 (6.5%) of recruits. In the 52 Veteran Affairs patients and 24 active duty (non-recruit) members, the incidence of malignancy during a neck mass work-up was 25.0% and 16.7% respectively.

Conclusion: The majority of neck mass evaluations in military recruits represent reactive lymphadenopathy with a significant decrease in the incidence of malignancy compared to the veteran population. However, malignancy was observed in approximately 7% of recruits evaluated in the Otolaryngology clinic for a neck mass. These findings confirm the need for careful evaluation of all patients presenting with a neck mass.

Introduction

The Naval Station Great Lakes is the largest training center in the Navy and home of the only Navy Recruit training command that graduates approximately 40,000 new Navy sailors each year [1]. Military recruits from diverse geographic locations are placed in close living and working quarters for approximately eight weeks of intense training. The crowded close-contact environment, demanding physical training, and stressful working conditions contribute to a higher rate of respiratory disease seen in military trainees compared to U.S. civilian adults [2-3]. Adenovirus vaccinations and hand washing programs are among several successful interventions that have been implemented to decrease the incidence of respiratory illness in military recruits [4-5]. However, despite preventive measures, respiratory illnesses occur in military recruits and can present with a variety of findings to include cervical lymphadenopathy.

Persistently enlarged lymph nodes, as well as other types of neck masses, are often seen at the Otolaryngology-Head and Neck Surgery clinic. For a recruit, after evaluation and work-up, several outcomes are possible to include observation, treatment, and possible disqualification from military training. The aim of the study was to review the evaluation of a neck mass in the military recruit and identify any significant differences that may exist in this group.

Methods and Materials

- A retrospective study was performed on 150 patients who were evaluated by the Otolaryngology-Head and Neck Surgery clinic with cervical lymphadenopathy and/or neck mass from January 1, 2011 to September 1, 2014.
- Patients were identified using the International Classification of Diseases (ICD) 9th edition code used in the VA electronic medical record system.
- Data collection included demographic data, diagnosis, pathology, imaging, laboratory results, and disposition.
- Institutional Review Board approval was obtained for the study.
- Patients were divided into four groups: (1) Military Recruits (2) Active duty members (3) Family dependents (4) Veterans.
- Age was treated as continuous variable and the two groups were compared using an independent Student's t test. Each categorical variable was separately analyzed using Fisher's exact test in categorical analysis. Significance level was set *a priori* at $p=0.05$. The data analysis was generated using SPSS statistical software (Version 22; IBM Corp).

Table 1. Comparison of patient demographics and pathology between Recruits and Veterans

	Recruit	Veteran	P-value
Age in years, mean (range)	21.6 (18-30)	61.5 (33-89)	<0.0001
Gender	Male: 38 Female: 8	Male: 50 Female: 2	0.027
Pathology	Benign: 43 Malignant: 3	Benign: 40 Malignant: 12	0.023

Results

Of the 150 patients evaluated, 46 (30.7%) were recruits of which, 10 (21.7%) were disqualified from military training. Reactive lymphadenopathy was the most common diagnosis seen in 20 (43.5%) recruits followed by neck infection (15.2%), congenital neck mass (15.2%), salivary pathology (10.9%) benign soft tissue lesions (8.7%), and malignancy in 3 (6.5%) of recruits. In the 52 Veteran Affairs patients and 24 active duty (non-recruit) members, the incidence of malignancy during a neck mass work-up was 25.0% and 16.7% respectively.

There was a significantly higher mean age ($p<0.001$), greater male to female ratio ($p=0.027$), and higher incidence of malignancy ($p=0.023$) in the Veteran group compare to the Recruit group. The Veteran group was also more likely to have had a fine needle aspiration ($p=0.049$) during the work-up and pre-existing comorbidities ($p<0.001$). Neck imaging was performed in 82.6% of Recruits and 78.8% of Veterans ($p=0.638$). Pseudofolliculitis barbae (PFB) with reactive lymphadenopathy and/or infection was significantly higher in the Recruit group ($p=0.030$).

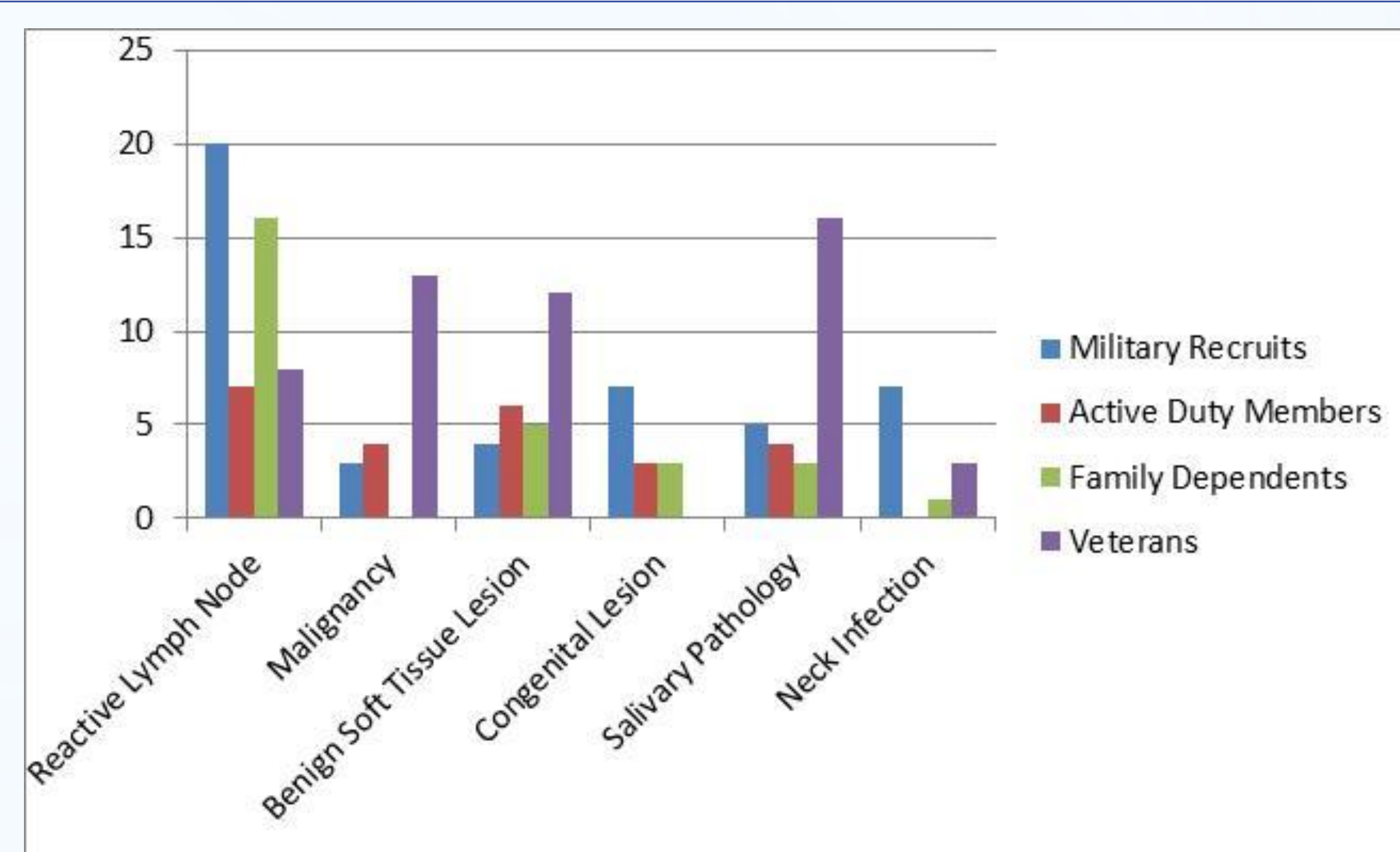


Chart 1. Types of Neck mass among the different groups

Discussion

Military recruits are placed in a crowded environment with unique stressors that can increase the risk of respiratory illness compared to the civilian population [2,3,5]. Adenovirus, group A Streptococcus pyogenes and influenza virus are responsible for over half of febrile respiratory illnesses [6]. Respiratory Syncytial virus has also been implicated in up to 11% of clinically important respiratory illness in this population [3]. These respiratory illnesses can lead to periods of convalescence, increase training time, and possible continue virus transmission to new recruits as they resume training [7]. Some of these patients may develop persistent significant lymphadenopathy and will be referred to the Otolaryngology clinic. Reactive lymphadenopathy was the most common diagnosis seen in the Recruit group (43.5%) and highest percentage within the same pathology among the other groups (39.2%).

In addition, neck infection was seen in 15.2% of recruits presenting with a neck mass, which was also the highest percentage among the other groups (63.6%). One contributing factor was PFB. Military's grooming standards require service men to shave daily. In a outside survey of 50 men with PFB only 42% were aware of their condition before entering the service [8].

Despite the majority of the neck mass representing benign disease in the Recruit group, 3 patients (6.5%) showed malignancy. This included two cases of Hodgkin's lymphoma and one case of nasopharyngeal carcinoma. In addition, 10 recruits (21.7%) with a neck mass resulted in disqualification from military service. This included 30% with previously undiagnosed congenital lesions lesion, which was also the highest percentage within the same pathology among the other groups (63.6%).

Conclusions

The majority of neck mass evaluations in military recruits represent reactive lymphadenopathy, neck infection, and congenital lesions. The recruits mean age and crowded environment likely contribute to this finding. Despite the significant decrease in the incidence of malignancy compared to the veteran population (higher mean age), malignancy was observed in approximately 7% of recruits in the study. These findings confirm the need for careful evaluation of all patients presenting with a neck mass.

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