Tuberculous and non-tuberculous cervical lymphadenopathy incidence and distribution in Somalia from 2016 to 2020: A review of 241 cases

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Abstract

Objective: To determine the incidence of tuberculous lymphadenitis (TBL) and other pathologies in cervical lymphadenopathies in Somalia and accompanying radiological findings.

Methods: In this hospital-based retrospective study, the demographic characteristics, pathology results and radiological findings of 263 patients who underwent ultrasound (US)-guided cervical lymph node biopsy between January 2016 and February 2020 were analyzed.

Results: Of 241 patients 118 men and 123 women (mean age 27.9 ± 18.1 years) included in the study, 46.1% (n = 111) were diagnosed as necrotizing granulomatous lymphadenitis (caseified, consistent with TBL) and 21.6% (n = 12, atypical lymphoid cells and n = 40, metastases) as malignancy. The most common type of metastasis was squamous cell cancer (n = 31), and the primary source of most of them was esophageal cancer (16/31, 51.6%). The age of patients with TBL was significantly lower than that of non-TBL (21.9 ± 14.6 vs. 41.9 ± 24.6, P = 0.003) and the incidence of TBL in pediatric patients was statistically higher (58.0% vs. 21.5%, P = 0.019). The rate of patients with TBL being localized at level 4 and level 5 was significantly more than non-TBL patients (18.0% vs. 10.0% and 23.4% vs. 10.8%, respectively, P = 0.01). Half of patients with TBL who have chest radiography had pathological findings; consolidation and bronchopneumonia were present in 52.6% of them. There were 2 patients with paravertebral abscess and one patient with gastrointestinal tuberculosis.

Conclusion: In Somalia, in the presence of cervical lymphadenopathy, after diagnosis by using US-guided biopsy; primarily considering of TBL and malignancy, thoracic involvement should be investigated, and esophageal carcinoma must be excluded in terms of metastatic lymph node.

KEYWORDS

Cervical lymphadenopathy, Tuberculosis, Tumor metastasis, Ultrasound-guided biopsy

Abbreviations: CMV, cytomegalovirus; CNB, core needle biopsy; EBV, Epstein-Barr virus; EPTB, extrapulmonary tuberculosis; FNAB, fine-needle aspiration biopsy; HIV/AIDS, human immunodeficiency virus/acquired immune deficiency syndrome; LTBL, latent tuberculosis infection; NGL, necrotizing granulomatous lymphadenitis; NTM, non-tuberculosis mycobacteria; PCR, polymerase chain reaction; SCC, squamous cell carcinoma; SSA, Sub-Saharan Africa; STRTEH, Somalia Turkey Recep Tayyip Erdogan Education and Research Hospital; TB, tuberculosis; TBL, tuberculous lymphadenitis; WHO, World Health Organization; US, ultrasound.

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INTRODUCTION

Cervical lymphadenopathy has been documented as the most common type of peripheral lymphadenopathies worldwide and may occur due to many underlying diseases such as lymphoma, viral or bacterial lymphadenitis, tuberculosis, sarcoidosis, carcinoma, collagen vascular diseases and reticuloendothelial system diseases. In previous studies, the most common cause of cervical lymphadenopathy in Sub-Saharan Africa (SSA) has been reported as tuberculous lymphadenitis (TBL) with a rate of 17%-66%. Tuberculosis (TB) is a common and in many cases fatal infectious disease caused by various species of mycobacteria, mainly *Mycobacterium tuberculosis*. Tuberculosis is one of the 10 most common causes of death worldwide and the leading cause of death from a single infectious agent (ranking above HIV/AIDS). It is estimated to be based on the 2019 global TB report: 10.0 million (range, 9.0-11.1 million) new cases per year, 1.2 million (range, 1.1-1.3 million) in HIV-negative people and 251,000 deaths (range, 223,000-281,000) in HIV-positive people. Although the burden of the disease varies between countries, the world average is around 130 (range, 5-500) per 100,000, and also while SSA has 12% of the world's population, it accounts for 29% of 9 million TB cases.

While TB typically manifests as a lung infection, it can affect almost all other organs and tissues of the body. Extrapulmonary TB (EPTB) constitutes about 15% to 20% of all TB infections and most frequently affects the lymph node. Lymphadenitis is the most common presentations of EPTB and most frequently seen in the cervical region lymph nodes. Evaluation of cervical lymphadenopathies is a common diagnostic problem faced by clinicians. Although medical history, physical examination, laboratory tests and radiological evaluation are performed for diagnosis, it is often inevitable to perform biopsy for pathological examination for definitive diagnosis. Excisional biopsy, fine-needle aspiration biopsy (FNAB) and core needle biopsy (CNB) are the most commonly used methods in the evaluation of cervical lymph nodes. Although excisional biopsy is widely used in diagnosis and treatment planning, especially in cases with suspected lymphoma, it may not be suitable for some patients due to its time-consuming and invasive nature, wound infection, damage to vascular and neural structures, and large scar. Ultrasound (US)-guided percutaneous biopsy (FNAB or CNB) is the first choosed method used in the evaluation of cervical lymphadenopathy because it is simple, cost effective, safe and minimally invasive. Although there are many data on the etiology of cervical lymphadenopathy in many African countries, there is only one study covering the 6 month period between 2016-2017 and examining a limited number of patients on the causes of cervical lymphadenopathy and TBL incidence in Somalia. The primary purpose of this study is to investigate the frequency of lymphadenopathies due to TB and other causes, radiological findings accompanying TBL and the effectiveness of percutaneous biopsy methods in patients who underwent US-guided percutaneous biopsy (FNAB or CNB) for cervical lymphadenopathy in an over four years period, in "Somalia Turkey Recep Tayyip Erdogan Education and Research Hospital" (STRTEH) the most equipped hospital in the region.

MATERIALS AND METHODS

Study population

We carried out a retrospective and observational study involving patients admitted to the STRTEH interventional radiology unit. In this study, between January 2016 and February 2020, demographic characteristics and pathology results of the patients were investigated retrospectively from medical records. For this purpose, the US-guided percutaneous biopsy (FNAB or CNB) results of patients received two weeks of antibiotic therapy for cervical lymphadenopathy and have symptoms that do not resolve after four weeks of observation, and sonographically having pathological lymph node features were analyzed. Radiological examinations (radiography, US, CT) in the Picture Archiving Communication Systems (PACS) were evaluated prospectively by an experienced interventional radiologist of eight years. Biopsies performed on head and neck masses other than lymph nodes were not included in this study. These are benign cystic lesion (n = 11), pleomorphic adenoma (n = 3), warthin tumor (n = 2), lipoma (n = 2), and fibroblastic proliferation (n = 1). Additionally, thyroid nodules were excluded from the study. Among cervical lymphadenopathies, 8.5% (21/248) of the patients who underwent FNAB and 6.7% (1/15) of the patients who underwent CNB were not diagnosed and these patients were excluded from the study. After the first evaluations, 241 patients with confirmed pathological diagnosis were included in the study, and the patients were divided into two groups as TBL and non-TBL. Written informed consent form that fully explains the advantages, disadvantages, risks and possible complications of FNAB and CNB is obtained from all patients in the hospital. The study was performed upon approval by the local ethical committee (MSTH-3398, 12.02.2020).

Ultrasound examination

A detailed US examination was performed for each patient before US-FNAB and US-CNB. The location, size, and sonographic features of lymph nodes (shape, edge, echogenic hilus, cortex, and the presence of calcification and cystic necrosis) were evaluated using a 7.5 MHz high-resolution linear transducer (Canon Aplio 500, Ota-warra, Japan). The localization of the affected lymph nodes was divided into six regions (Levels 1-6) according to the classification defined by Robbins et al. The size of lymph nodes was measured using the short axis diameter (perpendicular to the longitudinal axis). Sonographically, the lymph node with the most suspicious morphological features was accepted as the target. In the process, B-mode grayscale and color Doppler US used to avoided from necrotic areas and possible damage of neighboring vascular structures.
**US-CNB or FNAB and pathological examination**

Routine coagulation screening tests were performed before biopsy, and all biopsies were performed by an interventional radiologist under US guidance. After the skin was disinfected with povidone-iodine solution, local anesthesia was applied with 2% lidocaine. Intravenous anesthesia support was provided to pediatric patients. Sterile plastic sheath was placed on the US probe. A 22-gauge (G) needle was inserted for FNAB. When the needle was in the targeted area, aspiration was performed a minimum of three times with a 10-cc syringe and samples were taken from each patient at least twice to ensure sample adequacy. The aspirated material was spread on the glass slide. Some of the slides were placed in alcohol, while the remaining part was air dried. Air-dried preparations were stained using the May-Grünewald-Giemsa Quick (MGG-Q) method and those fixed to alcohol using the Papanicolaou staining method. One slide was air dried and stained with Ziehl-Neelsen stain to detect different species of acid-resistant bacilli (ARB).

16 G, 18 G and 20 G third generation automated biopsy needle (Estacore®) were used for the US-CNB. The number of biopsies taken ranged from 1 to 6, depending on the suspicious cause of lymphadenopathy and the quality of the sample on visual examination. Manual compression was applied for approximately 30 minutes at the insertion site to prevent subcutaneous hematoma formation. Intravenous anesthesia support was provided to pediatric patients.

**Statistical analyses**

All analyses were performed using SPSS software v. 22.0 (IBM SPSS Statistics Version 22.0, Armonk, NY: IBM Corp.). The variables were divided into two groups as categorical or continuous. Categorical variables were expressed as numbers and percentages and compared with the chi-square ($\chi^2$) test. Continuous variables were expressed as mean ± standard deviation (mean ± SD). The Kolmogorov Smirnov test was used to test normality and a $P > 0.05$ was considered to indicate normally distributed data. Continuous variables that showed normal distribution were compared using Student's $t$ test, whereas the Mann-Whitney $U$ test was used for non-normally distributed samples. The statistical significance level was accepted as $P < 0.05$.

**RESULTS**

Of the 241 patients included in the study, 227 (94.2%) were diagnosed by FNAB and 14 (5.8%) by CNB method. The mean age was 27.9 ± 18.1 years, 118 (49.0%) of the patients were male and 123 (51.0%) were female. While 67 (27.8%) patients were children (in the 0-17 age group) and 174 (72.2%) were adult. According to the pathological examination reports, 46.1% ($n = 111$) of the lymph nodes were diagnosed as necrotizing granulomatous lymphadenitis-NGL (caseified, consistent with TBL) and 21.6% were diagnosed as malignancy ($n = 12$ atypical lymphoid cells and $n = 40$ metastases). The frequency of pathological conditions that cause lymphadenopathy by age distribution is shown in Table 1. The distribution of patients with TBL and metastatic lymph nodes by age is shown in Figures 1 and 2. Cytomorphological results were confirmed clinically, radiologically and endoscopically. For squamous cell carcinoma (SCC) metastases, first clinical and endoscopic investigation was performed on the skin, oral cavity, larynx and esophagus. Nasopharyngeal examination was performed clinically and radiologically. 31 SCC metastases were reported as follows; 16 (51.6%) esophageal carcinoma (cervicothoracic $n = 14$ and middle esophagus $n = 2$), 5 (16.1%) laryngeal carcinoma, 4 (12.9%) hypopharyngeal carcinoma, 4 (12.9%) nasopharyngeal carcinoma and 2 (6.5%) oral cancers.

The demographic characteristics of the patients with TBL and non-TBL, the localization and sizes of the lymph nodes are detailed in Table 2. The age of patients with TBL was significantly lower than that of non-TBL (21.9 ± 14.6 vs. 41.9 ± 24.6, $P = 0.003$), and the incidence of TBL in pediatric patients was statistically higher (35.1% vs. 21.5%, $P = 0.019$). The female/male ratio in patients with TBL was:

| Diagnosis                                      | Age groups (n) | 0-17 | 18-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | Total n (%) |
|-----------------------------------------------|----------------|------|-------|-------|-------|-------|-------|-------|-------------|
| NGL (consistent with tuberculous lymphadenitis)| 39             | 45   | 11    | 7     | 4     | 2     | 3     | 111   | 46.1%       |
| Chronic active nonspecific lymphadenitis      | 9              | 20   | 4     | 3     | 1     | 4     | 1     | 42    | 17.4%       |
| Reactive lymphoid hyperplasia                 | 12             | 14   | 4     | 1     | 2     | 1     | 2     | 36    | 14.9%       |
| Squamous cell carcinoma metastasis            | 4              | 8    | 2     | 5     | 3     | 5     | 4     | 31    | 12.9%       |
| Atypical lymphoid cell                        | 3              | 2    | 4     | 0     | 0     | 2     | 1     | 12    | 5.0%        |
| Carcinoma metastasis (primary uncertain)      | 0              | 1    | 1     | 2     | 2     | 0     | 0     | 6     | 2.5%        |
| Neuroendocrine tumor metastasis               | 0              | 1    | 0     | 0     | 0     | 1     | 2     | 2     | 0.8%        |
| Papillary thyroid carcinoma metastasis        | 0              | 0    | 0     | 1     | 0     | 0     | 0     | 1     | 0.4%        |
| Total n (%)                                   | 67             | 91   | 26    | 19    | 12    | 14    | 12    | 241   | 100.0%      |

NGL: necrotizing granulomatous lymphadenitis
1. TBL was most located on the right side of the neck (60/111, 54.1%) and level 2 (43/111, 38.7%). The rate of patients with TBL being localized in level 4 and level 5 was significantly higher than that of non-TBL patients (18.0% vs 10.0% and 23.4% vs 10.8%, respectively, \( P = 0.01 \)). The ARB test was positive in 48.6% (54/111) of the patients with TBL.

Of the patients diagnosed with TBL, 34.2% (38/111) had chest radiography. In half of them (19/38, 50.0%), no pathology was found on radiographs. Abnormal findings were observed in 19 patients; consolidation and bronchopneumonia in 52.6% (n = 10), bronchopneumonia and hilar enlargement (lymphadenopathy) in 15.8% (n = 3), and 31.6% (n = 6) had isolated hilar enlargement (lymphadenopathy) (Figure 3). Also, 9 of bronchopneumonia and consolidation were perihilar and centrally located. Only 6.3% (7/111) of the patients with TBL had a CT report. Two of these patients had bronchopneumonia, pleural effusion and granuloma, and three had mediastinal necrotic lymph nodes (Figure 4). There were three patients with extrapulmonary pathology. One of two patients with paravertebral abscess had multiple intraabdominal necrotic lymph nodes. Peritonitis, gastrointestinal involvement and multiple necrotic lymph nodes were found in a patient with abdominal tuberculosis involvement (Figure 5). US-guided lymph node biopsy and images of pathological results are shown in Figure 6.

Ten of the patients underwent excisional biopsy after FNAB and the diagnosis was confirmed histopathologically. In one of ten patients who underwent excisional biopsy, the cytopathological diagnosis was interpreted as a suspected malignancy, but the histopathological diagnosis of this patient was confirmed as reactive lymphoid tissue (false positivity rate 10%).

**DISCUSSION**

This study is the most comprehensive study conducted on the etiology of patients with cervical lymphadenopathy in the Somali population. This current study showed that NGL (consistent with tuberculous lymphadenitis) constituted the majority of 241 patients (n = 111, 46.1%) who underwent biopsy for cervical lymphadenopathy over a 5-year period, followed by malignant lesions (n = 52, 21.6%). The indications for lymph node biopsy in Somalia are as follows; uncertain diagnosed lesions, malignancy and suspected TB. As in our study, TB dominance in Somalia stands out. In many reports, TB was the most common cause of cervical lymphadenopathy in tropical regions. Sarda et al. found that 86% of cervical lymphadenopathies were of TB origin. This high rate indicates that lymph node biopsy was performed with good clinical screening and possibly appropriate patient selection. Similar to the rate in our study, previous studies reported that the incidence of TBL in underdeveloped countries ranged from 41.5% to 63%.

In Somalia, TB is a serious public health problem. The estimated incidence in 2015 was 274 cases per 100,000 persons, but fewer than half of the estimated cases are actually detected. Somalia is one of the countries with the most infectious diseases (especially TB) and advanced malignancies in the world due to reasons such as the effect of the civil war that has been going on for a quarter of a century, the absence of public health policies and the lack of a regular health system. Another parameter showing the underdevelopment of the country’s health system is that it has the highest rate among maternal mortality and child deaths under the age of five. A significant portion of the population migrates to other countries due to adverse living conditions such as drought, floods, poverty and famine added in recent years. It was found that 57.5% (2,386/4,147) of the TB cases reported in Denmark between 1990-1999 were foreign nationals (foreign-born) and 37.8% (901/2,386) of them were Somali origin people. The fact that HIV prevalence is quite low in Somalia with TB revealed that the high prevalence of TB infection should be explained by other mechanisms. The main hypothesis is that latent M. tuberculosis infections are subsequently reactivated in Somali immigrants. Conditions that cause the re-activation of the disease include vitamin deficiencies, genetic factors and immune system defects. The prevalence of TB in Somalia is due to reasons such as poor hygiene, poverty, many people living in the same house, and insufficient vaccination programs. Bacille Calmette-Guérin (BCG) vaccination was not performed in both patient groups with TBL and
TABLE 2 Comparison of lymphadenopathies with and without tuberculous lymphadenitis [n (%)].

| Variables                        | Tuberculous lymphadenitis (n = 111) | Non-tuberculous lymphadenopathy (n = 130) | All patients (n = 241) | P value |
|----------------------------------|-------------------------------------|------------------------------------------|------------------------|---------|
| Male gender                      | 56 (50.5)                           | 62 (47.7)                                | 118 (49.0)            | 0.669   |
| Pediatric (0-17 years old)       | 39 (35.1)                           | 28 (21.5)                                | 67 (27.8)             | 0.019<sup>a</sup> |
| Age (years)<sup>a</sup>          | 21.9 ± 14.6                         | 41.9 ± 24.6                              | 27.9 ± 18.1           | 0.003<sup>b</sup> |
| Lymph node diameter (mm)<sup>a</sup> | 23.1 ± 9.4                         | 25.8 ± 11.3                              | 24.1 ± 10.1           | 0.246   |
| Location                         |                                     |                                         |                       |         |
| Right side                       | 60 (54.1)                           | 65 (50.0)                                | 125 (51.9)            | 0.534   |
| Left side                        | 48 (43.2)                           | 58 (44.6)                                | 106 (44.0)            |         |
| Bilateral                        | 3 (2.7)                             | 7 (5.4)                                  | 10 (4.1)              |         |
| Cervical triangle                |                                     |                                         |                       |         |
| Level 1                          | 0                                   | 2 (1.5)                                  | 2 (0.8)               | 0.010<sup>a</sup> |
| Level 2                          | 43 (38.7)                           | 66 (50.8)                                | 109 (45.2)            |         |
| Level 3                          | 21 (18.9)                           | 35 (26.9)                                | 56 (23.2)             |         |
| Level 4                          | 20 (18.0)                           | 13 (10.0)                                | 33 (13.7)             |         |
| Level 5                          | 26 (23.4)                           | 14 (10.8)                                | 40 (16.6)             |         |
| Level 6                          | 1 (0.9)                             | 0                                       | 1 (0.4)               |         |

<sup>a</sup>Values are presented as mean±standard deviation;<br><sup>b</sup>P < 0.05.

FIGURE 3 Chest radiographs of two different patients with tuberculous lymphadenitis. (A) Parenchymal infiltrations (red arrows) and left hilar enlargement (lymphadenopathy) in the middle zone of both lungs of a 21-year-old male patient, (B) bilateral hilar enlargement (white arrows) in a 17-year-old female patient.

non-TBL in our study population. However, as a promising development, in STRTEH, which was established in 2015 within the scope of humanitarian aid in the capital Mogadishu, a vaccination campaign and program against TB was initiated in February 2017. Although more research is needed to understand the specific needs of the developing world populations, helping these populations should be a primary goal. Laboratories and equipment should be established to diagnose the country’s microbiological problems.

Current health interventions for TB prevention are treatment of latent TB infection (LTBI), prevention of transmission of M. tuberculosis through infection prevention and control, and vaccination of children with the BCG vaccine. World Health Organization
guidelines published before 2018 suggest that testing and treatment for LTBI is strongly recommended, although the priority group for bacteriologically confirmed cases of pulmonary TB is children under five years of age, the updated guideline published in 2018 contains an additional recommendation for countries with high TB incidence to consideration of testing and treatment for persons five years of age and older with household contact of bacteriologically confirmed pulmonary TB cases. According to the data of our study, more than two-thirds (84/111) of TBL cases constituted the young population under the age of 30 and more than one-third (39/111) of children under 17 years of age. In countries with a high prevalence of tuberculosis, people are exposed more intensively, on average, and show tuberculosis at an earlier age. In support of this, the fact that TBL is an early postprimary complication causes cervical TBL to be more common in young people. Our study supports that children and young people are in the risk group for TB in Somalia. However, the ability of African health systems to respond to, manage, and control the growing number of tuberculosis cases has been limited by constraints in funding, facilities, staff, drug supplies, and laboratory capacity. Another problem concerns the early diagnosis and treatment of tuberculosis, which limits the spread of the disease and reduces deaths. These unfavorable conditions and troubles are worse in Somalia compared to other African countries.

Mycobacterial infection is the most common cause of cervical granuloma and indicates the presence of tuberculosis (M. tuberculosis, M. bovis, M. africanum) and non-tuberculosis mycobacteria (NTM). Clinical diagnosis of NTM lymphadenitis is difficult and positive culture is required for a definitive diagnosis. But the culture takes a long time and results may indeed remain negative for a long time given the difficulty of growing NTM, which is an intracellular bacterium that is fragile ex vivo. Similar to the literature, the current study revealed that 48.6% of patients diagnosed with TBL were positive for ARB testing. However, since specific microbiology tests (e.g., BACTEC NAP or immunochromatographic TB Ag MPT64 rapid test) were not available in Somalia, the diagnosis was based on clinical, radiological and cytological findings. Although this is a limitation for our study, the available data are important for predicting TBL incidence in the region. Although, differential diagnoses including tuberculous lymphadenitis, cytomegalovirus (CMV), Epstein-Barr virus (EBV), bartonella infection or toxoplasmosis and confirmation of mycobacterial infection and species-level identification with advanced laboratory techniques, including polymerase chain reaction (PCR) are important, laboratories providing
these conditions are just being created or developed according to new requirements. For example, within the scope of TB Control Strategy, with regular budget funds, WHO started to provide laboratory support (including PCR based diagnosis), training, TB drugs in Somalia.

FNAB, which is inexpensive, reliable and easily performed, continues to be the most preferred method in the diagnosis of cervical lymphadenopathy. Especially in the presence of US-guided and enough sample taking from the appropriate part of the lesion and an experienced pathologist, FNAB sensitivity is close to 100%. Since there is no endoscopic ultrasound, positron emission tomography and oncology unit in Somalia, FNAB was the first step in the evaluation of cervical lymph nodes. The diagnosis of primary tumors in our cases was unclear at the first examination. Patients were examined clinically and radiologically according to cytological findings, and primary tumors were identified. There are many studies investigating the effectiveness of FNAB in cervical lymph nodes. Although it is an accepted technique with a sensitivity of over 90% in infectious/inflammatory diseases and metastatic disease, its place in the diagnosis of lymphoproliferative diseases is controversial. The success rate of FNAB has been reported to vary between 38% and 88.8% in the identification of the correct subtype of lymphoma. However, some studies in the literature have reported a lower sensitivity (72%) for FNAB in neck lymphomas, and open surgical biopsy is recommended. In our current study, the diagnosis of lymphoma was made by clinical and radiological confirmation of the presence of atypical lymphoid cells according to the FNAB result. In general, the sensitivity of FNAB was high (91.5%), consistent with the literature. Unfortunately, since there is no oncology clinic and radiotherapy unit in Somalia, only ten of the patients underwent excisional biopsy after FNAB and the diagnosis was confirmed histopathologically. In one of ten patients who underwent excisional biopsy, the cytopathological diagnosis was interpreted as a suspected malignancy, besides the histopathological diagnosis of this patient was confirmed as reactive lymphoid tissue (false positivity rate 90%).

In the present study, three-quarters of the nodal metastases, which constitute an important cause of cervical lymphadenopathy, are SCC metastases and half of them (51.6%) are esophageal tumors, and this rate is considerably higher than previous studies. In the epidemiological study conducted by Tahtabasi et al., unlike the cancer incidence in other countries, it was reported that esophageal cancer was seen most frequently in both genders in Somalia and it was stated that these cancers were present at advanced stage and with nodal metastasis. Investigating head and neck SCC metastases in an Egyptian study, Saafan found that the primary source of lymph node metastases was laryngeal carcinoma (32%) and hypopharyngeal carcinoma (22%). In a different study, from Korea, the primary source of metastatic lymph nodes that make up 38% of cervical lymph nodes were reported as oral cavity (48.2%), oropharynx (23.0%) and larynx (28.8%) in order of frequency. In our study,
although it was seen in all decades, it peaked in young adults (in the 3rd decade), addition to all these, however previous studies reported that metastatic lymph nodes were more common in the 5th decade and later.\textsuperscript{35,36} This situation can be explained by factors such as esophageal and head and neck cancer patients who are admitted to the hospital at an advanced stage and patients do not have chemoradiotherapy options. Moreover, these findings suggest that it is necessary to conduct further studies and to develop endoscopic screening methods for esophageal carcinoma in Somalia.

Bhattarcharya et al.\textsuperscript{37} found only that 27.9% (51/183) of the chest radiographs of patients with a diagnosis of cervical TBL had pathological findings and the others were normal. They stated that the most common radiography was pulmonary infiltration (n = 32) followed by hilar enlargement (n = 17). On the other hand, in most of the different studies, lower rates of abnormal radiography (3.1% to 20%) were reported.\textsuperscript{38–40} In our study, differently, the rate of abnormal radiography was higher and pathological findings were detected in 50.0% (n = 19) of 38 radiographs performed on 111 TBL patients. Of 19 patients with abnormal findings, 52.6% (n = 10) had consolidation and bronchopneumonia, 15.8% (n = 3) had bronchopneumonia and hilar enlargement, and 31.6% (n = 6) had isolated hilar enlargement. In addition to lung pathologies, two had paravertebral abscesses and one had peritonitis consistent with abdominal tuberculosis involvement, gastrointestinal involvement (confirmed by PCR test performed in an external WHO-supported laboratory) and multiple necrotic lymph nodes.

There is compelling evidence to suggest that incisional lymph node biopsy increases chronic wound discharge rates as compared with excisional lymph node biopsy. Especially, in patients with tuberculosis cervical abscess, incisional biopsy and drainage may cause the development of recurrent abscesses and persistent sinus drainage. If these complications persist despite medical therapy for 6 months, the lymph nodes must be excised.\textsuperscript{41}

The most important limitations of this study are the retrospective nature of the study, the absence of radiological research for thoracic involvement in all TBL patients, and the fact that pathological and radiological diagnosis is not supported by specific microbiological diagnosis. Another limitation of the study is that most patients who underwent US-guided cervical lymph node biopsy were not operated for the final diagnosis. Nevertheless, we think our data will guide future studies as it is the most comprehensive study of head and neck masses in Somalia.

CONCLUSIONS

We think that this current study is valuable in that it is the first most comprehensive study investigating the etiology of cervical lymphadenopathy in Somalia in the last five years and includes information that will help develop strategies to prevent infectious diseases such as TB in the region. Accordingly, in Somalia for the young population, in the presence of cervical lymphadenopathy or neck mass, it is important to be diagnosed at an early stage by using FNAB and then investigate thoracic involvement with at least chest radiography primarily considering TB. In addition, considering that metastatic lymph nodes also play a role in the etiology, SCC metastasis of the esophagus should be excluded. By the initiation of tuberculosis and cancer screening program in Somalia reducing the mortality and morbidity associated with related to the diseases, minimizing the socioeconomic burden caused by these diseases and providing treatment opportunities are important health priorities. It is also important for Somali specialist doctors to learn and apply US-guided biopsy methods that are inexpensive, reliable and can be performed anywhere. Finally, in Somalia, global support is needed for tuberculosis and metastatic cancers in order to achieve WHO’s TB strategy goals.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by Ethics Committee of Somalia Turkey Recep Tayyip Erdogan Education and Research Hospital and conducted in accordance with the Declaration of Helsinki. As this study is retrospective, the requirement for informed consent by the ethics committee was waived. All data on the patients was anonymized or maintained with confidentiality.

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