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Causes of cervical lymphadenopathy, prospective study

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Abstract
Background: Cervical lymphadenopathy refers to lymphadenopathy of the cervical lymph nodes (the glands in the neck), the term lymphadenopathy strictly speaking refers to disease of the lymph nodes.
Objectives: To diagnose the causes of the cervical lymphadenopathy.
Method: This is a prospective study on 100 patients with cervical lymphadenopathy from the period of January 2017 to January 2019.
Results: One hundred patients were studied, 60 female (60%) and 40 male (40%), and female to male ratio was 1.5:1, The age ranged from 1 to 70 years, with a mean age of 20 years $\pm$ 5 years. The majority being in the 2nd decade of life constituting 50 patients (50%). Also our study showed that the causes of the cervical lymphadenopathy are reactive adenitis 40 patients (40%) followed by acute bacterial suppurative adenitis 30 patients (30%), chronic non specific adenitis 15 patients (15%), tuberculosis adenitis 5 patients (5%), secondary metastases 4patients (4%), Hodgkin lymphoma 3 patients (3%), non Hodgkin lymphoma 2 patients (2%), infectious mononucleosis 1 patient (1%).
Conclusion: Our study showed that the causes of the cervical lymphadenopathy are reactive adenitis followed by acute bacterial suppurative adenitis, chronic non specific adenitis, tuberculosis adenitis, secondary metastases, Hodgkin lymphoma, non Hodgkin lymphoma, infectious mononucleosis. In our study we considered the incisional or excisional biopsy with or without Fine-needle aspiration cytology befor it, and it is the best diagnostic methods to diagnose the pathology of the lymphadenopathy, and all patients are treated according to his or her condition and there was no death rate during our study.

Keywords: lymphadenitis, lymphoma, tuberculosis

1. Introduction

The neck is the transitional area between the cranium superiorly and the clavicles inferiorly that joins the head to the trunk and limbs, it serves as a major conduit for structures passing between them, in addition, several important organs with unique functions are located here [1]. The neck is relatively slender to allow the flexibility necessary to position the head to maximize the efficiency of its sensory organs (mainly the eyeballs but also the ears, mouth, and nose) [1]. Thus many important structures are crowded together in the neck, such as muscles, glands, arteries, veins, nerves, lymphatics, trachea, esophagus, and vertebrae [1]. The neck is a well-known region of vulnerability, several vital structures, including the trachea, esophagus, and thyroid gland, lack the bony protection afforded other parts of the systems to which these structures belong [1]. The main arterial blood flow to the head and neck (the carotid arteries) and the principal venous drainage (the jugular veins) lie anterolaterally in the neck [1]. Lymph from structures in the head and neck drain into cervical lymph nodes, lymph from all of the body except the superior right quadrant enters the venous system through the thoracic duct in the root of the neck [1]. The sternocleidomastoid muscle divides the neck into the anterior and the posterior triangles [2]. The anterior triangle is bounded above by the body of the mandible, posteriorly by the sternocleidomastoid muscle, and anteriorly by the midline [2]. It is further subdivided into the carotid triangle, the digastric triangle, the submental triangle, and the muscular triangle [2]. The posterior triangle is bounded posteriorly by the trapezius muscle, anteriorly by the sternocleidomastoid muscle, and inferiorly by the clavicle.(2) The posterior triangle of the neck is further subdivided by the inferior belly of the omohyoid muscle into a large occipital triangle above and a small supraclavicular triangle below [2]. The investing layer of the deep cervical fascia lies deep to the skin, between the skin and the investing layer is the platysma muscle [3]. Other than subcutaneous lipomata and sebaceous cyst, most neck swelling lie deep to the platysma [3]. When considering the swelling that may arise in any anatomical region, may be enumerates the anatomical structures lying there in and then the pathological swelling that may arise from them [4]. The lymphatic drainage of the head and neck is of considerable clinical importance [5]. The most important chain of nodes are the jugular nodes (also called cervical), which run adjacent to the internal jugular vein [5]. The other main groups are the submental, submandibular, pre- and post-auricular, occipital and posterior triangle nodes [5]. Cervical lymphadenopathy refers to lymphadenopathy of the cervical lymph nodes (the glands in the neck), the term lymphadenopathy strictly speaking refers to disease of the lymph nodes [6], often however the term refers to enlargement of the lymph nodes, similarly, the term lymphadenitis refers to inflammation of a lymph node, but often it is used as a synonym of lymphadenopathy [7]. Cervical lymphadenopathy is a sign or a symptom, not a diagnosis, the causes are varied, and may be inflammatory, degenerative, or neoplastic [7]. The upper limit in size of a normal node varies with location, and of course the size cut off used depends on the desired sensitivity and specificity, in Cervical lymph nodes, the size criteria are, most nodes are 10 mm in short-axis and sub-mental and

sub-mandibular are 15 mm and the retropharyngeal are 8 mm, there is an error rate of 10-20% if using size criteria alone and the long-to-short axis ratio has also been proposed [8]. In children up to the age of 12, cervical nodes up to 1 cm in size may be palpable and this may not signify any disease [9]. If nodes heal by resolution or scarring after being inflamed, they may remain palpable thereafter [6]. In general, lymph nodes greater than 1 cm in diameter are considered to be abnormal [10]. In children, most palpable cervical lymphadenopathy is reactive or infective, in individuals over the age of 50, metastatic enlargement from cancers (most commonly squamous cell carcinomas) of the aerodigestive tract should be considered [6].

Patients and Method

This is a prospective study on 100 patients with cervical lymphadenopathy from the period of January 2017 to January 2019.

Results

One hundred patients were studied, 60 female (60%) and 40 male (40%), and female to male ratio was 1.5:1 The age ranged from 1 to 70 years, with a mean age of 20 years $\pm$ 5 years. The majority being in the 2nd decade of life constituting 50 patients (50%). Also our study showed that the causes of the cervical lymphadenopathy are reactive adenitis 40 patients (40%) followed by acute bacterial suppurative adenitis 30 patients (30%), chronic non specific adenitis 15 patients (15%), tuberculosis adenitis 5 patients (5%), secondary metastases 4patients (4%), Hodgkin lymphoma 3 patients (3%), non Hodgkin lymphoma 2 patients (2%), infectious mononucleosis 1 patient (1%). As showed in table NO 1 and table NO 2.

Table 1: Age distribution of patients.

Age group (Years)	Total	%
1 – 10	10	10%
11 -20	50	50%
21 - 30	15	15%
31 – 40	10	10%
41- 50	5	5%
51-60	6	6%
61-70	4	4%
Total	100	100%

Table 2: Causes of cervical lymphadenopathy.

Causes of cervical lymphadenopathy	No of patients	%
Reactive adenitis	40	40%
Acute bacterial suppurative adenitis	30	30%
Chronic non specific adenitis	15	15%
Tuberculosis adenitis	5	5%
Secondary metastases	4	4%
Hodgkin lymphoma	3	3%
Non Hodgkin lymphoma	2	2%
Infectious mononucleosis	1	1%
TOTAL	100	100%

Discussion

Enlargement of the cervical lymph nodes commonly occurs with viral infections. These "reactive" nodes are usually small, firm and non-tender and they may persist for weeks to months.

Acute bacterial adenitis is characterised by larger nodes >10mm, which are tender and may be fluctuant. Most typically these are in the anterior part of the neck. There is often associated fever and warm, erythematous overlying skin. The majority are caused by Staphylococcus Aureus or Group A Streptococcus (Strep pyogenes). A site of entry may be found e.g. mouth or scalp. Anaerobic bacteria may be associated with dental disease in older children. Also consider Kawasaki Disease - unilateral, >15mm, painful nodes and other associated features. Persistent enlargement of lymph nodes (> 2 weeks) may be caused by a number of other conditions:

Atopic Eczema: Significant persistent enalargement may be associated with atopic eczema. These nodes are often more prominent in the posterior part of the neck and are usually bilateral.

Infections :- Infectious mononucleosis (EBV), cytomegalovirus - may have generalised lymphadenopathy and hepatosplenomegaly. Mycobacterium avium complex - Adenoapthy is usually unilateral and most cases occur in the under 5-year age group. Non-tender, slightly fluctuant node, which may become tethered to underlying structures. Violaceous hue to the overlying skin is sometimes seen. Systemically well. Usually not immunocompromised. Mycobacterium tuberculosis - non-tender nodes. History of exposure. Systemic symptoms of fever, malaise, weight loss. Cat Scratch Disease (Bartonella henselae) - tender, usually axillary, nodes. History of a cat scratch or lick 2 weeks prior. There may be a papule at the site. Toxoplasma gondii - generalised lymphadenopathy. Systemic features of fatigue or myalgia, HIV (human imune diffeciency virus).

Malignancy: Lymphoma - Hodgkins, Non-Hodgkins, Leukaemia, secondaries from other organ with malignent diseas.

Rheumatologic conditions: Juvenile chronic arthritis, SLE(systemic lupus erythematosis). The location of a lump or swelling in the neck will often give a good indication of the tissue of origin, and the age of the patient may also help suggest the most likely diagnoses. The duration of the lesion is also relevant: one that has been present since an early age is likely to be of congenital origin, while a lump appearing

in later life and persisting may be malignant. Cervical lymphadenopathy is the commonest form of peripheral lymphadenopathy [11]. It has many causes, including benign, infectious and malignant conditions. The evaluation of cervical lymphadenopathy is a common diagnostic challenge facing clinicians. While a careful history and thorough physical exam can help identify the cause of lymphadenopathy, pathological examination is the definitive diagnostic test. Open biopsy is time consuming and costly, requiring theatre time and anesthesia. Fine needle aspiration (FNA) is less invasive, cheaper, and quicker. However, cytology from FNA specimens may have diagnostic limitations for many conditions compared with histologic evaluation of biopsy specimens. FNA analysis additionally requires a well-trained pathologist and is best done onsite, both rare commodities in many parts of sub-Saharan Africa [12]. Core needle biopsy is an intermediate technique in terms of cost, time, and information obtained, but can be dangerous in the neck, especially when performed by clinicians who are inadequately trained [13]. A clinician may also choose to empirically treat for tuberculosis (TB) or bacterial infection based on history and physical examination, and reserve biopsy or FNA for patients who do not respond to therapy. However, this strategy will delay definitive diagnosis and treatment of a malignancy. The optimal strategy for evaluating cervical lymphadenopathy in resource-limited settings like Malawi is largely unknown given the relative advantages and disadvantages of these varying approaches, particularly in light of recent expansion of diagnostic pathology services to Lilongwe. A large body of literature suggests that TB is the most common cause of cervical lymphadenopathy in sub-Saharan Africa, accounting for 17–66% of cases [11, 14, 15–16]. In Malawi, at Kamuzu Central Hospital (KCH) during the years 1985–1988, TB was reported to be most common cause lymphadenopathy(17). However, no recent study has assessed causes of cervical lymphadenopathy in Malawi in the modern era, particularly since the beginning of the HIV epidemic and rapid scale-up of antiretroviral therapy (ART) nationwide among HIV-infected individuals. Currently, more than 60% of those needing ART are now receiving it(18). In this study, we describe the pathological diagnoses for patients with cervicallymphadenopathy presenting to KCH who underwent a diagnostic biopsy. We also suggest strategies to improve diagnosis and management of patients with cervical lymphadenopathy. Our study showed that the causes of the cervical lymphadenopathy are reactive adenitis followed by acute bacterial suppurative adenitis, chronic non specific adenitis, tuberculosis adenitis, secondary metastases, Hodgkin lymphoma, non Hodgkin lymphoma, infectious mononucleosis. In our study we considered the incisional or excisional biopsy with or without Fine-needle aspiration cytology befor it, and it is the best diagnostic methods to diagnose the pathology of the lymphadenopathy, and all patients are treated according to his or her condition and there was no death rate during our study. Table 3 showed the causes of cervical lymphadenopathy in our study in comparison with other study.

Table 3: Causes of cervical lymphadenopathy in patients in our study in comparison with another studies.

Causes of cervical lymphadenopathy	Our study	2nd study(19)	3rd study(20)
Reactive adenitis	40	72	28
Acute bacterial suppurative adenitis	30		
Hodgkin lymphoma & Non Hodgkin lymphoma	5	21	14
Chronic non specific adenitis	15		
Secondaries metastases	4	101	46
Tuberculosis adenitis	5	76	17
Infectious mononucleosis	1		
Total	100	270	105

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