ABSTRACT: BACKGROUND: This study was done to determine the causes of cervical lymphadenopathy in a particular age group of people who attended the surgical department in a tertiary care hospital. AIM: To determine the most common cause of cervical lymphadenopathy in the general population between the age group of 20yrs to 70yrs attending the surgical department in a tertiary hospital. METHODS: A total of 100 patients were studied during the period from May 2012 to April 2015. Various factors were taken into account such as, the age of the patient, the place from where they came from and the various clinical investigations done. RESULTS: The causes of cervical lymphadenopathy due to various causes such as tuberculosis, non-specific lymphadenitis, secondaries and lymphoma were studied. The results were then tabulated. During the course of the study, tuberculosis (59%), was found to be the commonest cause of cervical lymphadenopathy, followed by non-specific lymphadenitis (24%), secondary deposits (12%) and lymphomas (5%). CONCLUSION: This research article shows that, tuberculosis is still found to be the commonest cause of cervical lymphadenopathy in the general population in our country. Thus cervical lymphadenopathy requires meticulous examination and should not be ignored.

KEYWORDS: Cervical lymphadenopathy, Tuberculosis, Non-specific lymphadenitis, Secondary deposits, lymphomas.

INTRODUCTION: Cervical lymph node enlargement is one of the most common swellings in the neck. Lymph node enlargement is seen in many diseases and may be due to a localized pathology or a part of a generalized disease. The cervical lymph nodes may be affected due to a head and neck disease or as a manifestation from a distant organ. Due to this, the various clinical investigations and knowledge about the lymphatic drainage of different areas are important. Inflammation of the cervical lymph nodes is a common entity in developing and underdeveloped countries. In India, though many cases are due to tuberculosis, one must always remember the fact that cervical lymph node enlargement can be secondary to an underlying malignancy.

In this country, tuberculosis is still rampant and the presence of matted nodes or the presence of a pulmonary focus of infection warrants thorough investigation of the patient for the presence of tuberculosis. The histopathological evidence of tuberculosis on biopsy, fine needle aspiration cytology, or demonstration of AFB in culture is very important. FNAC has emerged as an important tool that is cost-effective and simple to perform. It can be done as an out-patient procedure and does not require much preparation of the patient. FNAC remains a very important investigation for differentiating benign from malignant cervical lymphadenopathy. Cervical lymphadenopathy is a condition that requires meticulous examination of the patient and should not be ignored.
AIM OF THE STUDY: To determine the causes of cervical lymphadenopathy in the general population between the age group of 20yrs to 70yrs attending the surgical department in a tertiary hospital and to determine the most common cause of cervical lymphadenopathy in the above mentioned group from the data obtained during the course of the study.

MATERIALS AND METHODS: All the patients in the study attended the surgical department and were meticulously examined and investigations such as FNAC, blood investigations, sputum examinations and chest x-rays were done.

Inclusion Criteria:
- Patients attending the surgical out-patient department, who are diagnosed to have cervical lymphadenopathy at the time of their first visit.
- Patients between the age group of 20 yrs to 70 yrs.
- A thorough clinical history of the patient was taken. History of chronic cough, discharging sinus, pyrexia, loss of weight and loss of appetite along with cervical lymphadenopathy were some of the important signs and symptoms looked for.\[11-16\]

Exclusion Criteria:
- Patients who have generalized lymphadenopathy at the time of their first visit to the surgical out-patient department.
- Patients below 20 yrs and patients above 70 yrs of age.

Factors Analyzed:
- Age
- Gender
- Disease

Investigations Done:
- Urine examination: To rule out diabetes mellitus. Tuberculosis commonly occurs in the presence of diabetes mellitus.
- Blood: Total count of white blood cells and differential count as well as the peripheral smear examination are helpful in elucidating neoplastic lesions. A relative lymphocytosis is seen in patients with tuberculosis.
- ESR: ESR is elevated in tuberculosis and in many other conditions as well.
- Haemoglobin: This gives an idea about the general health of the patient as well as anaemia if present.
- Chest X-ray: This is useful to find any calcified nodes, and soft tissue swellings in the lungs and in the mediastinum. It also helps to find out areas of fibrosis, consolidation or pleural effusion within the lungs.
- ENT examination: To determine the primary focus.
- UGI endoscopy: To determine any primary pathology in the upper gastro intestinal tract.
- Bronchoscopy: To determine the primary focus in the lungs.
- USG scan: To determine any abdominal or pelvic primaries.
CT scan: To determine the primary in head, neck, and in the chest. It is also used to assess the extent of lymph node involvement.

Fine Needle Aspiration Cytology (FNAC): Cytological diagnosis is based on the cellular characteristics (nuclear size, chromatin architecture, nucleolus, etc.) and the degree of cohesion of cells (reduced in cancer patients). These cytology smears are made on glass slides and fixed with isopropyl alcohol prior to examination by the cytologist. The stains most commonly used are the Giemsa and the Papanicolaou stains, but it is important to stress that many of the special stains used in histopathology can be used for the evaluation of the cytological materials.

**OBSERVATION:** This study was based on 100 patients with cervical lymphadenopathy. The patients who attended the surgical department and referred from various wards for opinion and biopsy procedures were subjected to detailed study.

Those who attended the surgical department with cervical lymphadenopathy were given a course of antibiotics. Those who were not responding to therapy for more than a week after treatment and those who showed an increase in size and involvement of more number of lymph nodes irrespective of treatment were utilized for this study. After thorough clinical examination, they were subjected to laboratory and radiological investigations. For confirmation of diagnosis FNAC was done. If the results were inconclusive, then excision biopsy of the lymph node was done under local or general anaesthesia depending upon the patient’s condition.

| Sex of the Patient | No. of Patients Affected | Percentage |
|--------------------|--------------------------|------------|
| Male               | 45                       | 45%        |
| Female             | 55                       | 55%        |

*Table 1: Sex wise incidence of cervical lymphadenopathy*

According to this table, it was found in this study that cervical lymphadenopathy was found to affect women more than men. This was found particularly among people living in the rural areas.

**Graph 1: Sex wise incidence of cervical lymphadenopathy**
According to this table, in the study, cervical lymphadenopathy most commonly occurred between the age group of 20 to 40 years, and the elderly age group were found to be affected the least.

| Age Group (Yrs.) | No. of Patients | Percentage |
|------------------|----------------|------------|
| 20-30            | 47             | 47%        |
| 31-40            | 34             | 34%        |
| 41-50            | 11             | 11%        |
| 51-60            | 7              | 7%         |
| 61-70            | 1              | 1%         |

*Table 2: Age wise incidence of cervical lymphadenopathy*

According to this table, tuberculosis was found to be the commonest cause of cervical lymphadenitis. Due to poverty, and its associated factors like overcrowding, malnutrition, low educational standards, public ignorance and the alarming spread of HIV, the incidence of tuberculosis seems to be high. The resistance of the mycobacterium to many drugs and poor compliance of patients may also be important factors.
Number of patients = 59

| Sex of the Patient | No. of cases | Percentage |
|--------------------|--------------|------------|
| Male               | 22           | 37.28%     |
| Female             | 37           | 62.71%     |

**Table 4: Sex wise incidence of tuberculosis**

From the above table, it was found in this study that tuberculosis affected women more commonly. It may be due to malnutrition which was found to be more common in women, and as a sequelae to decreased immunity in that particular population.

Number of patients = 59

| Age Group (yrs) | No. of Patients | Percentage |
|-----------------|-----------------|------------|
| 20-30           | 33              | 55.93%     |
| 31-40           | 19              | 32.20%     |
| 41-50           | 6               | 10.16%     |
| 51-60           | 1               | 1.69%      |
| 61-70           | -               | -          |

**Table 5: Age wise incidence of tuberculosis**
From the above table, it was found in this study that cervical lymphadenitis due to tuberculosis commonly affected the younger and the middle age group people. Subclinical infection produces immunity and this may be there as on for the falling incidence of tuberculosis in the elderly age group.

Number of patients = 59

| Lymphnode Group    | No. of cases | Percentage |
|--------------------|--------------|------------|
| Submandibular      | 2            | 3.38%      |
| Upper cervical     | 39           | 66.10%     |
| Middle cervical    | 2            | 3.38%      |
| Lower cervical     | 13           | 22.03%     |
| Posterior cervical | 2            | 3.38%      |
| Multiple nodes     | 1            | 1.69%      |

*Table 6: Lymph node groups involved in tuberculosis*
Number of patients = 5

| Sex of the patient | No. of patients | Percentage |
|--------------------|----------------|------------|
| Male               | 3              | 60%        |
| Female             | 2              | 40%        |

*Table 7: Sex wise incidence of Lymphoma patients*

Graph 7: Sex wise incidence of Lymphoma patients

Number of patients = 12

| Sex of the patient | No. of patients | Percentage |
|--------------------|----------------|------------|
| Male               | 7              | 58.33%     |
| Female             | 5              | 41.66%     |

*Table 8: Sex wise incidence of secondaries*

Graph 8: Sex wise incidence of secondaries

Number of patients = 12
Table 9: Age wise incidence of secondaries

| Age Group (yrs) | No. of Patients | Percentage |
|-----------------|-----------------|------------|
| 20-30           | 2               | 16.66%     |
| 31-40           | 1               | 8.33%      |
| 41-50           | 3               | 25%        |
| 51-60           | 5               | 41.66%     |
| 61-70           | 1               | 8.33%      |

Graph 9: Age wise incidence of secondaries

Number of patients = 24

Table 10: Sex wise incidence of non-specific lymphadenitis

| Sex of the patient | No. of patients | Percentage |
|--------------------|-----------------|------------|
| Male               | 13              | 54.16%     |
| Female             | 11              | 45.83%     |

Graph 10: Sex wise incidence of non-specific lymphadenitis

Number of patients = 24
**DISCUSSION:**

A) **Tuberculosis:** Patients were followed up from 9 weeks to 1 year with a regular follow up schedule of once a month. During the follow up period, the patients were allowed to undergo thorough clinical examination.

In this follow up, 70% of the patients got improvement in their general condition. The size of the gland got reduced in 65% of patients during follow up.

B) **Non-specific lymphadenitis:** All the patients with non-specific lymphadenitis were treated with antibiotics. The nodes regressed in size within two months of antibiotic therapy.

C) **Secondaries:** Out of the 12 patients, 5 patients had CA stomach and palliative anterior gastrojejunostomy was done with pre and post-operative chemotherapy. 4 patients had CA thyroid for which total thyroidectomy was done with modified radical neck dissection. 3 patients had CA breast for which modified radical mastectomy was done followed by chemotherapy.

D) **Lymphoma:** Out of the 5 patients, debulking of the tumour was done in one case and then referred for radiotherapy. The other four cases were referred to the oncology department for radiotherapy.
CONCLUSION: This study was based on the examination of 100 patients with cervical lymphadenopathy during the period from May 2012 to April 2015. The study brought out the following facts.

Tuberculosis was found to be the commonest cause of cervical lymphadenopathy (59%), followed by non-specific lymphadenitis (24%), secondary deposits (12%), and lymphomas (5%).

REFERENCES:
1. Rothenberg SM, Ellisen LW (2012), the molecular pathogenesis of head and neck squamous cell carcinoma. J clin invest 122: 1951-1957.
2. Mokhtari S (2012), mechanisms of cyst formation in metastatic lymph nodes of head and neck squamous cell carcinoma. Diagnpathol 7: 6.
3. Hoang JK, Vanka J, Ludwig B, Glastonbury CM (2013) evaluation of cervical lymph nodes in head and neck cancer with ct and mri: tips, traps, and a systematic approach. Ajr am j Roentgenol 200: w17-25.
4. Ferlito A, Robbins KT, Shah JP, Medina JE, Silver CE, et al. (2011) proposal for a rational classification of neck dissections. Head neck 33: 445-450.
5. Sureshkannan P, Vijayprabhu, John R (2011) role of ultrasound in detection of metastatic neck nodes in patients with oral cancer. Indian j dent res 22: 419-423.
6. Saafan ME, Elguindy AS, Abdel–Aziz MF, Abdel–Rahmanyounes A, Albirmawy OA, et al. (2013) assessment of cervical lymph nodes in squamous cell carcinoma of the head and neck. Surgery curr res 3: 145. Doi:10.4172/2112-1000145.
7. Ackerman. L. V.; surgical pathology, 5th edition, c. v. Mosby and co. 726, 1974.
8. Arora V.K. and Ramesh Varma: Indian. j. Tuberculosis, 38, 79-80, 1991.
9. Verbruggen, Marjolijn B.; Verheijen, René H.M.; van de Goot, Frank R.W.; More. American Journal of surgical pathology. 30(6):739-743, June 2006.
10. Bon Seok Koo, Eun Chang Choi, Yong-Ho Park, Eung-Hyub Kim, Young Chang Lim. Occult Contralateral Central Lymph Node Metastases in Papillary Thyroid Carcinoma with Unilateral Lymph Node Metastasis in the Lateral Neck. Journal of the American College of Surgeons, Vol. 210, Issue 6, p895–900.
11. Beathnach C. S: british journal of tuberculosis and disease of chest, 330-4, 1958.
12. C. Blanchard, C.Brient, C. Volteau, F. Sebag, M. Roy, D. Drui, A. Hamy, M. Mathonnet, J.-F. Henry and E. Mirallié. Factors predictive of lymph node metastasis in the follicular variant of papillary thyroid carcinoma. British Journal of Surgery. Volume 100, Issue 10, September 2013, Pages: 1312–1317. DOI: 10.1002/bjs.9210.
13. M. J. Shim, J.-L. Roh, G. Gong, K.-J. Choi, J. H. Lee, S.-H. Cho, S. Y. Nam and S. Y. Kim. Preoperative detection and predictors of level V lymph node metastasis in patients with papillary thyroid carcinoma. British Journal of Surgery. Volume 100, Issue 4, March 2013, Pages: 497–503. DOI: 10.1002/bjs.9024.
14. Cervical lymphadenitis: Research committee of tuberculosis association of India, Ind. J. Tub 1987. 34, 96 - 100.
15. Vishak. S, Vinayak Rohan. Cervical node metastasis in T1 squamous cell carcinoma of the tongue- pattern and predictive factors. Indian Journal of Surgical Oncology. June 2014, Volume 5, Issue 2, pp 104-108.
ORIGINAl ARTICLE

16. A. A. Hooper. Tuberculous peripheral lymphadenitis. British Journal of Surgery. Volume 59, Issue 5, May 1972, Pages: 353–359. DOI: 10.1002/bjs.1800590506.

AUTHORS:
1. Vikram Yogish
2. P. S. Venkateswaran
3. C. Rajkamal

PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of General Surgery, SRM Medical College and Research Centre, Kattankulathur, Tamilnadu, India.
2. Professor, Department of General Surgery, SRM Medical College and Research Centre, Kattankulathur, Tamilnadu, India.

FINANCIAL OR OTHER COMPETING INTERESTS: None

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Vikram Yogish,
Flat 101, First Floor, ‘Prince Regent’,
No. 40, Thambuswamy Road,
Kilpauk-600010, Chennai.
E-mail: vikram.yogish@yahoo.com

Date of Submission: 28/09/2015.
Date of Peer Review: 29/09/2015.
Date of Acceptance: 09/10/2015.
Date of Publishing: 21/10/2015.