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# Study of the Causes of Superficial Lymph Node Pathology in Gezira state Sudan 2010- 2015

**Omer Ahmed Elrhima[1], Ogail Yousif Dawod[2], Tellal Babiker Ageeb[3], Mohammed Elfaki[1], Talal Hashim A. Elhasan[4], Alia Mirghani Ahmed Mirghani MD[5], Faiza Abdalla Saeed Khiery[6], Amar Babikir Elhussein[7], Amna MohammedAli Mustafa[8], Husham E. Homeida[9], Lamyaa El Hassan[1], Ayman H. Alfeel[10*]**

[1]Department of Medical Basic Sciences, Faculty of Medicine, Jazan University, Jazan, Saudi Arabia.
Email ID : omerelrhima@gmail.com , melfaki@jazanu.edu.sa, lelhassan@jazanu.edu.sa

[2]Department of Physical Therapy, College of Nursing and Health Sciences, Jazan University, Jazan, Saudi Arabia,
Email ID : odawod@jazanu.edu.sa

[3]Department of Epidemiology, Tropical Medicine Research Institute, Sudan.
Email ID : alfakster@gmail.com

[4]Border Guard Centre. KSA.
Email ID : Talalhashim87@gmail.com

[5]Assistant professor of pathology, Gezira University, Sudan.
Email ID : aliamirghani2024@gmail.com

[6]Assistant Professor, Department of Public health, College of Nursing and Health Sciences, Jazan University, Saudi Arabia.
Email ID : Fkheiry@jazanu.edu.sa

[7] Associate professor, Department of Biochemistry and Molecular Biology, Faculty of Medicine, Nile University. Sudan.
Email ID : Ammarbab@yahoo.com

[8] Assistant Professor, Department of Nursing, College of Nursing and Health Sciences, Jazan University, Saudi Arabia.
Email ID : ammustafa@jazanu.edu.sa

[9] Department of Maxillofacial Surgery and Diagnostic Science. College of Dentistry. Jazan University. KSA.
Email ID : hisham792@hotmail.com

[10] Department of Medical Laboratory Sciences, College of Health Sciences, Gulf Medical University, Ajman, United Arab Emirates.
Email ID : aymanalfeel@gmail.com

***Corresponding author:**

Ayman H. AL feel,

Email ID : aymanalfeel@gmail.com

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## ABSTRACT

Background: Lymphadenopathy is a complicated medical condition for the patient, the parent, and the physician. Various etiologies ranging from infectious to autoimmune as well as malignancy may cause lymphadenopathy. However, limited studies have focused on the clinicopathological significance of this condition.

Objective: This study aims to investigate the spectrum of neoplastic and non-neoplastic diseases causing superficial lymph node enlargement in Gezira, Sudan, across different age groups and genders. It also correlates the findings with clinical data to determine the prevalence of various underlying conditions in Gezira State, Sudan.

Method: The retrospective observational study was carried out in Gezira State, Sudan, from April 2010 to April 2015. We analyzed the data of 591 lymph node biopsy specimens that were received at the Medical Laboratory Department of Pathology, Faculty of Medicine, Gezira University.

Results: Of the 519 superficial lymph node biopsies that were performed, 377 (72.6%) were from the cervical region, 65 (12.5 %) were from the axillary lymph nodes, 45 (8.7%) were from the inguinal region, and 32 (6.2 %) were from the supraclavicular lymph node, with male predominance affecting all age groups. Supportive lymphadenitis was found to be the most prevalent condition affecting the lymph node, followed by reactive hyperplasia and tuberculosis non-Hodgkin lymphoma, which was more common than Hodgkin lymphoma and metastasis.

Conclusion: Lymph node involvement is far more prevalent in non-neoplastic diseases compared to neoplastic processes, with lymphadenitis being the predominant underlying pathological cause

**Keywords**: *lymphadenopathy, superficial lymph node, neoplastic and non-neoplastic diseases*

## 1. INTRODUCTION

Lymph nodes are a major anatomical component of the immune system, with around 600 presents in the body, though only a few are palpable. Lymph node histology reflects the immune system's response to antigens, which determines the immune reaction and effector cells involved, affecting lymph node morphology [(1)].

Lymphadenopathy, the abnormal enlargement of lymph nodes, is a challenging condition to diagnose and treat. It can occur in people of any age and at various sites in the body. There is a wide spectrum of underlying causes, including infections (such as bacterial, viral, or fungal), autoimmune conditions, and malignancies (such as lymphoma or metastatic cancers). Each of these potential causes presents with different clinical features and requires particular diagnostic and treatment strategies. There are various classifications of lymphadenopathy, clinically classified as generalized if lymph nodes are enlarged in two or more contiguous areas or localized if only one area is involved [(2)].

lymphadenopathy, is a common clinical presentation that can be either peripheral or visceral. Peripheral lymphadenopathies are easily detected during routine exams and often biopsied due to their accessibility. The presence of enlarged lymph nodes in outpatient settings may raise concerns about potential serious underlying conditions [(3)].

The diverse etiologies of lymphadenopathy make it important to conduct a comprehensive clinical evaluation, including a detailed patient history, physical examination, and often, further diagnostics, such as blood tests, imaging, or even biopsy for histopathological examination. Correlating the clinical findings with the pathological results is crucial to accurately determine the underlying etiology and formulate an appropriate treatment strategy [(4)].

This study investigated the spectrum of diseases causing neoplastic and non-neoplastic lymph node enlargement in Gezira, Sudan, across different age groups and genders. By identifying the prevalence of various underlying conditions, the study seeks to enhance clinicians' understanding and improve their diagnostic and treatment strategies in the region.

## 2. MATERIALS AND METHODS

We conducted a retrospective observational study from April 2010 to April 2015 at the Gezira University Faculty of Medicine Medical Laboratory in Gezira, Sudan. Data and reports on lymph node biopsies were retrieved from the histopathology electronic medical record system at the medical laboratory, Faculty of Medicine, Gezira University. The study was approved by the ethical review committee of the Faculty of Medicine, Gezira University.

A total of 519 male and female patients, aged 5–80 years, were enrolled in this study. All clinically diagnosed cases of superficial lymphadenopathy that presented during the study period and had complete information regarding lymph node biopsy or cytological reports were included. Laboratory and sociodemographic data were obtained using this system. Cases in which histopathological evaluations were inconclusive due to the lack of adequate data required by the study protocol were excluded from the study.

## 3. STATISTICAL ANALYSIS:

The Statistical Package for the Social Sciences was used for data analysis. The analysis techniques involved descriptive and inferential statistics. Chi-square testing was used to examine frequency variation among the qualitative variables in this study.

## 4. RESULT:

Of the 519 cases, the majority were adult 380 while 139 were pediatric cases. (Chi=111.909, df=1, P. value <0.000) (Table 1). Results of the study showed the female gender accounted for 268 (48.4) and male 251 (48.4%) (Chi=0.557, df=1, *P. value* 0.456) male to female ratio was 1.2:1. Lymphadenitis is widely recognized as the most common underlying cause of lymphadenopathy in both sexes. Cervical lymphadenopathy was commonly observed, followed by axillary, inguinal, and supraclavicular cervical lymphadenopathies (**Table 2**).

**Table 1: Distribution of population according to age:**

| Variable | Frequency | Percent |
|---|---|---|
| **Pediatric** | 139 | 26.8 |
| **Adult** | 380 | 73.2 |
| **Total** | 519 | 100.0 |

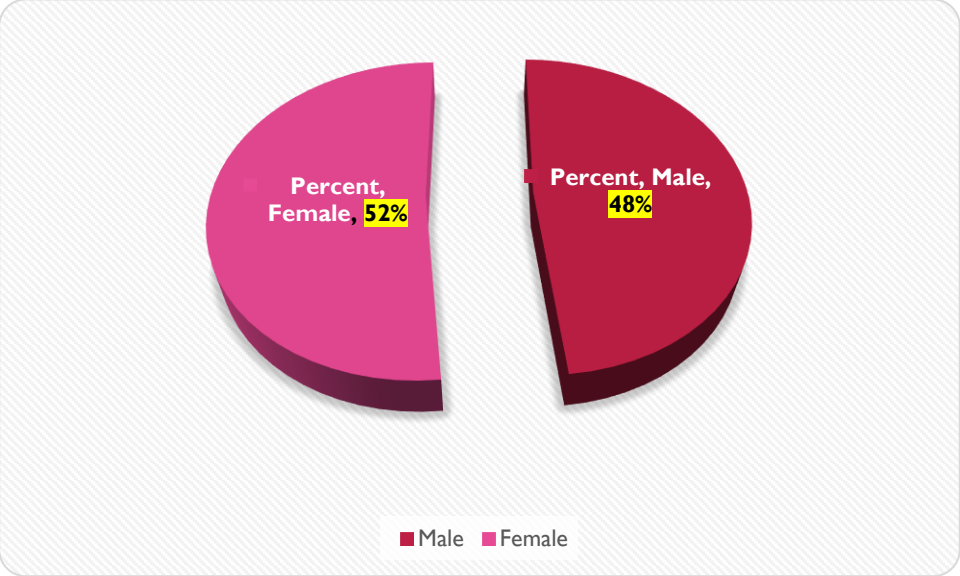


**Figure 1: Distribution of study population according to gender.**

The sites of lymphadenopathy were cervical lymph nodes in 377 (72.6%), axillary lymph nodes in 65 (12.5%), inguinal lymph nodes in 45 (8.7%), and supraclavicular lymph nodes in 32 (6.2%) patients (Chi=632.468, df=3, P. value <0.000). The results are presented in **Table 2**.

**Table 2: Distribution of lymph nodes according to site.**

| Variable | Frequency | Percent |
|---|---|---|
| **Cervical** | 377 | 72.6 |
| **Auxiliary** | 65 | 12.5 |
| **Inguinal** | 45 | 8.7 |
| **Supra Clavicle** | 32 | 6.2 |
| **Total** | 519 | 100.0 |

All biopsies were divided into 2 broad categories: neoplastic and non-neoplastic. The malignant neoplastic were sub-grouped into specific diagnoses with the help of histochemistry and immunohistochemistry (IHC). The histopathological diagnoses of the benign lesions were as follows: suppurative lymphadenitis, 162 (41.1%) cases; reactive hyperplasia, 112 (28.4%) tuberculous lymphadenitis78 (19.8%) and another benign lymphadenopathy accounting for 42 (10.7%) cases (**Figure 2**).

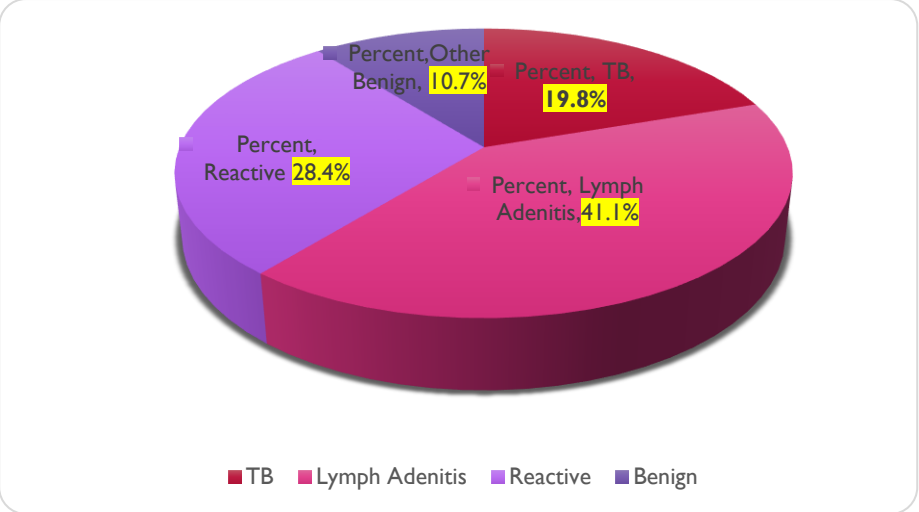


**Figure 2: Causes of benign lymphadenopathy.**

Malignant lymphoma was 94 cases (75.2%), while carcinoma was found in 31 (24%%) of malignant neoplasms (Chi = 31.75, *df = 1, P value <0.000)* (**Table 3**).

**Table 3: Causes of malignant lymphadenopathy.**

| Variable | Frequency | Percent |
|---|---|---|
| **Carcinoma** | 31 | 24.8 |
| **Lymphoma** | 94 | 75.2 |
| **Total** | 125 | 100.0 |

The majority of patients presenting with lymphadenopathy associated with reactive hyperplasia were of a relatively young age, being above 18 years old. Out of 94 lymphoma patients, 72 had non-Hodgkin's lymphoma, while 22 had Hodgkin's lymphoma (Chi=26.596, df=1, P-value <0.000). Burkitt lymphoma is a prevalent type of non-Hodgkin lymphoma observed in pediatric populations.

Similarly, lymphadenitis is considered the primary cause of benign lymph node enlargement in young individuals, whereas Burkitt non-Hodgkin lymphoma remains the predominant cause of malignant neoplasms.

## 5. DISCUSSION:

The present investigation made attempts to describe the histopathological pattern of superficial lymphadenopathy in Gezira State, Sudan. Lymphadenopathy is a clinical manifestation of many diseases. ranging from simple inflammatory processes to life-threatening conditions like lymphomas and metastatic carcinomas [(5)].

Palpable lymph nodes provide an important diagnostic clue to the underlying etiology. Histopathological evaluation of the lymph node remains the "gold standard" for diagnosis. In the present study, the incidence was higher in females compared to males, with a male to female ratio of 1.2:1.

Our study found that females were more commonly affected by the condition than males. Similar observations of male predominance were reported in an additional five studies [(6)(7)]. The underlying reasons for this gender-based discrepancy are not fully understood, but could be associated with variations in immune system function or societal factors that influence exposure to triggering events [(8)].

The findings of the study align closely with the results reported by Olu et al. in 2006, Nidhi et al. in 2011, and Ageep in 2012. The cervical group of lymph nodes had the highest number of biopsies, followed by the axillary and inguinal groups, while the supraclavicular nodes were the least commonly involved superficial lymph nodes [(9)(10)(5)].

The study done by Khan et al and Saafan et al also supports this, as they found the cervical group of a lymph node as the most commonly involved node [11][12]. Several authors have reported that tuberculosis is one of the predominant causes of lymph node enlargement in adults in a tropical country like Sudan. [12].

The present study found that lymphadenopathy caused by tuberculosis infection was more prevalent than in other studies. Non-specific reactive hyperplasia of lymph node tissue was the second most common lesion observed in our study, accounting for 28.4% of all cases. As reported by Lee et al., non-specific reactive hyperplasia is the most common cause of enlarged lymphadenopathy in the United States [13]. In contrast, a study conducted by Shaikh et al. found that reactive hyperplasia was the second most common cause, following tuberculosis, as in the present study. [14]. The prevalence of varied lesions leading to lymphadenopathy can differ across geographic regions, population demographics, and the quality of healthcare infrastructure [15].

In our present study, lymphadenitis was 41.1%, tuberculous 28.4%, reactive hyperplasia 19.8%, and 10.7% for other begnin lympadnopathy conditions. Our study showed more cases of non-Hodgkin's lymphoma than Hodgkin's lymphoma, which is similar to the findings of the study by Roy et al [7]. Additionally, reports in the western world indicate that non-Hodgkin's lymphoma is more common than Hodgkin's lymphoma15. Metastasis constitutes the second least common cause of superficial lymphadenopathy malignancy in our study, accounting for only 24.8% of all lymph node biopsies. There is a wide variation in the prevalence of metastatic tumors affecting lymph nodes, as demonstrated by the studies by Khan AU (32%) [12], Shaikh et al. (7%) [14], and Na DG (43.8%) [16].

## 6. CONCLUSION:

This study investigates key aspects of lymphadenopathy in Gezira State, Sudan, over a five-year period. The findings from this investigation provide a more detailed explanation of the various etiologies and common anatomical sites affected by lymphadenopathy, while also outlining the distribution of cases by age and gender. The results indicate that lymph node involvement resulting from non-neoplastic diseases is significantly more prevalent than those caused by neoplastic processes, with tuberculosis being the leading cause.

## REFERENCES

[1] Lucas, S. B. (2017). Lymph node pathology in infectious diseases. Diagnostic Histopathology, 23(9), 420-430. https://doi.org/10.1016/j.mpdhp.2017.07.002

[2] Chhabra, S., Mohan, H., & Bal, A. (2006). A retrospective histological evaluation of non-neoplastic superficial lymphadenopathy. J Intern Med, 6(1), 11.. https://doi.org/10.5580/1fc2

[3] Priyanka, S., Karuna, G., Sunita, S., & Ajay, Y. (2018). A study of Clinico-pathological Spectrum of Oral Cavity Lesions at a Tertiary Care Hospital. JMSCR, 6(4), 267-76. https://doi.org/10.18535/jmscr/v6i4.45

[4] Hines, C. M., Toy, E. C., & Baker III, B. (2001). The clinical evaluation of lymphadenopathy. Primary Care Update for OB/GYNS, 8(6), 209-217. https://doi.org/10.1016/s1068-607x(01)00084-1

[5] Ageep, A.K., 2012. Assessment of adult peripheral lymphadenopathy in Red Sea State, Sudan. International Journal of Tropical Disease & Health, 2(1), pp.24-32. https://doi.org/10.9734/ijtdh/2012/1008

[6] Manjula, K., Prasad, C.S.B.R., Gayathri, B.N. and Kumar, H., 2011. Cytomorphological study of lateral neck swellings. J Clin Diagn Res [serial online], 5, pp.1016-1019. https://doi.org/10.7860/JCDR/2011/.1561

[7] Roy, A., Kar, R., Basu, D. and Badhe, B.A., 2013. Spectrum of histopathologic diagnosis of lymph node biopsies: A descriptive study from a tertiary care center in South India over 5½ years. Indian Journal of Pathology and Microbiology, 56(2), pp.103-108. https://doi.org/10.4103/0377-4929.118692

[8] Janus, N. Z. (1977). Research on sex-roles in the mass media: Toward a critical approach. Insurgent Sociologist, 7(3), 19-31.. https://doi.org/10.1177/089692057700700302

[9] Olu-Eddo, A.N. and Ohanaka, C.E., 2006. Peripheral lymphadenopathy in Nigerian adults. Journal-Pakistan Medical Association, 56(9), p.405. https://pubmed.ncbi.nlm.nih.gov/17091753

[10] Nidhi, P., Sapna, T., Shalini, M. and Kumud, G., 2011. FNAC in tuberculous lymphadenitis: Experience from a tertiary level referral centre. Indian J Tuberc, 58(3), pp.102-7. https://pubmed.ncbi.nlm.nih.gov/21941948

[11] Khan, J., Ullah, A., Matolo, N., Waheed, A., Nama, N., Sharma, N., Ballur, K., Gilstrap, L., Singh, S.G., Ghleilib, I. and White, J., 2021. Prognostic value of lymph node ratio in cutaneous melanoma: A systematic review. Cureus, 13(10). 10.7759/cureus.19117

[12] Saafan, M.E., Elguindy, A.S., Abdel-Aziz, M.F., Abdel-Rahman Younes, A. and Albirmawy, O.A., 2013. Assessment of cervical lymph nodes in squamous cell carcinoma of the head and neck. Surgery Curr Res, 3(145), pp.2161-1076. https://doi.org/10.4172/2161-1076.1000145

[13] Lee, Y.T., Terry, R. and Lukes, R.J., 1982. Biopsy of peripheral lymph nodes. The American Surgeon, 48(10), pp.536-539. PubMed

[14] Shaikh, S.M., Baloch, I., Bhatti, Y., Shah, A.A., Shaikh, G.S. and Deenari, R.A., 2010. An audit of 200 cases of cervical lymphadenopathy. Med Channel, 16(1), pp.85-87.Google Scholar

[15] Chowdhury, M. B. O., Ahmed, A. M., & Chowdhury, A. (2015). Lymphadenopathy: Histopathological evaluation of 90 Cases in Chittagong. Chattagram Maa-O-Shishu Hospital Medical College Journal, 14(1), 19-21. https://doi.org/10.3329/cmoshmcj.v14i1.22874

[16] Na, D.G., Lim, H.K., Byun, H.S., Kim, H.D., Ko, Y.H. and Baek, J.H., 1997. Differential diagnosis of cervical lymphadenopathy: usefulness of color Doppler sonography. AJR. American journal of roentgenology, 168(5), pp.1311-1316. https://doi.org/10.2214/ajr.168.5.9129432