



**International Journal of TROPICAL DISEASE
& Health**
2(1): 24-32, 2012



SCIENCEDOMAIN *international*
www.sciencedomain.org

Assessment of Adult Peripheral Lymphadenopathy in Red Sea State, Sudan

Ali K. Ageep^{1*}

¹Department of Pathology, Faculty of Medicine, Red Sea University, Port Sudan, Sudan.

Research Article

Received 26th November 2011
Accepted 24th January 2012
Online Ready 4th March 2012

ABSTRACT

Background: Although peripheral lymphadenopathy is a common presentation in Red Sea State, Sudan, no previous work was made to assess its causes. So, this study is done to identify the underlying causes of peripheral lymph nodes enlargement in the adult patients.

Place and Duration of Study: Red Sea Medical Center laboratory, Port Sudan, Sudan between November 2006 and June 2010.

Methods: Three hundred twenty seven patients presented with lymphadenopathy were examined by FNAC and histopathological techniques. The sites and the causes of the enlarged lymph nodes were identified. Clinical data were collected in predesigned questionnaires.

Results: Generalized lymphadenopathy was found in 25 patients (7.7%). The vast majority of the patients (69.4%) had cervical lymph node enlargement. The commonest cause of lymphadenopathy was tuberculosis (39.5%), followed by metastatic diseases (24.7%). Non Hodgkin's and Hodgkin's lymphoma represent 16.6% of the patients. Metastatic tumors commonly present after the age of 50 years (92.6%). Females are more affected by TB than males (60.1%). In this study, 180 of the cases were females and 147 cases were males.

Conclusions: FNAC and in some cases lymph node biopsy should be done to any adult patient with chronic peripheral lymphadenopathy in the studied area. This will assist in the early diagnosis and proper management of the patients.

Keywords: Lymphadenopathy; pathology; TB; Red Sea State.

*Corresponding author: Email: aleykh@yahoo.com;

1. INTRODUCTION

Enlarged lymph nodes represent clinical manifestation of several diseases. This could be simple illness like inflammatory disorders, or in many occasions it might be caused by life threatening conditions, like metastatic carcinomas and lymphomas, which have the same clinical appearance (Rosai, 1996). Fine needle aspiration cytology (FNAC) and surgical biopsies are the gold standard methods in the diagnosis of the underlying pathology of these illnesses (Lau et al., 1998).

Tuberculosis (TB) is responsible for up to 43 percent of peripheral lymphadenopathy in the developing world (Dandapat, 1990). In the United States, about 20 percent of patients with TB have extra-pulmonary disease, and lymphadenitis is a presenting symptom in about 30 to 40 percent of cases (Rieder et al., 1990; Peto et al., 2009). Isolated peripheral tuberculous lymphadenitis is usually due to reactivation of disease at a site seeded hematogenously during primary TB infection, perhaps year's earlier (Alvarez et al., 1984). The human immunodeficiency virus (HIV) epidemic has been associated with an increase in the total incidence of TB and an increased proportion of miliary, disseminated, and extra-pulmonary TB cases including lymphadenitis (Hill et al., 1991).

The etiological factors of lymphadenopathy in adults are likely to be different from that in children. While metastatic cancer is documented widely as a major cause of lymphadenopathy in adults, a contrasting rarity of metastatic cancer has been consistently reported in children (Okolo, 2003; Lake et al., 1978). Moreover, reactive hyperplasia to minor stimuli has been reported as a significant cause of lymphadenopathy in children with a yet developing immune system (Adelusola et al., 1996).

Clinically, lymphadenopathy may be peripheral or visceral. Peripheral lymphadenopathies are easily detected by routine physical examination and are often biopsied as they are easily accessible for lymphadenectomy (Ochicha et al., 2007). Visceral lymphadenopathy on the other hand, requires laparotomy or sophisticated imaging techniques for detection. Among the peripheral nodes, those in the upper part of the body (cervical, supraclavicular, axillary) are preferentially biopsied than lower limb nodes (popliteal, inguinal or femoral) as the former are more likely to yield definitive diagnosis whereas the latter are often characterized by non-specific reactive or chronic inflammatory and fibrotic changes (Lee et al., 1982; Ferrer, 1998). In this study we have not considered the HIV status of the patients. However, Sudan has not got a high HIV prevalence as compared to other African countries (El-Sony et al., 2002; Hashim et al., 1997).

To our knowledge, this is the first research which assesses the causes of peripheral lymphadenopathy in Eastern Sudan. A similar study was formed in the center of the Sudan in 1992 by Kheriy et al., but in their work they concentrated only in the cervical groups of the lymph nodes (Kheriy et al., 1992) The aim of this study is to identify the underlying causes of peripheral lymph nodes enlargement in the adult patients in Red Sea State, Eastern Sudan, Sudan. Information from this study will be of benefit for the treating physicians and will assist in planning for control of the causative diseases. Data presented here will also form a baseline for further researches.

2. METHODS

2.1 Study Area/Setting

Three hundred twenty seven lymph nodes consecutive specimens were examined in the period from November 2006 to June 2011 in a histopathology laboratory in the Red Sea Medical center, Port Sudan, Sudan. This is the only regional laboratory, to which surgical biopsies and fine needle aspiration cytology were sent. The total number of the whole population was (739,300) according to the national census of 2002 with adjusted growth rate.

2.2 Sample Collection

FNAC samples were collected from each individual participating in this research. Surgical biopsies were indicated when the FNAC was inadequate and for staging of lymphoma cases.

2.3 Techniques Used

2.3.1 Histopathology

For the histopathology specimens, paraffin embedded blocks was prepared. Sections from the blocks were then stained by Haematoxylin and Eosin (H &E) stains.

2.3.2 FNAC

The conventional FNA technique with 10 ml syringe was used. Slides of the FNAC were stained by Papanicolaou and May-Grunewald Giemsa (MGG) stains. Special stains (including Ziehl-Neelson, Giemsa and silver stains) were used when indicated (when tumor cells were not seen). All histopathology and FNAC slides were examined by single expert histopathologist.

2.4 Data Collection

Clinical data regarding the age, sex and site of the enlarged lymph nodes were obtained in a predesigned questionnaire.

2.4.1 Exclusion criteria

Patients below 16 years are excluded from the research.

2.4.2 Ethical clearance

Informed consent was taken from all participants in this research. Ethical clearance was approved from the local Ethical Review committee (ERC).

2.4.3 Statistical analysis

Data were analyzed by using a computer Statistical Package for Social Sciences (SPSS) program version 16. Results are presented as frequency and percentage.

3. RESULTS

In this study, FNAC was done to all (327 patients) lymph node enlargement cases. 18.7% of the patients underwent surgical biopsy when the FNAC was inadequate (2.1%) or when they had been diagnosed as lymphoma (16.6%).

Generalized lymphadenopathy was found in 25 patients (7.7%). The vast majority of the patients (69.4%) had cervical lymph node enlargement (Table 1). Of the 327 patients, 147 were males and 180 were females (M: F=1:1.2). (Table 2) presents the histological diagnoses and age distribution of lymph node biopsies in Red Sea State. The prevalence of lymphadenopathies peaks in the age between 30 and 40 years, and decline thereafter. The commonest cause of lymphadenopathy was tuberculosis (39.5%), followed by metastatic diseases (24.7%). Lymphomas (in general) formed the third common cause of lymphadenopathy (16.6%). Non Hodgkin's lymphomas (14.4%) were more common than Hodgkin's lymphoma (2.2%). Metastatic tumors commonly presented after the age of 50 years (92.6%). Females were more affected by TB than males (60.1%). The peak age of presentation of tuberculous lymphadenitis was between 30-40 years (51.2%). Reactive lymphadenopathy (mostly follicular, paracortical and sinus hyperplasia) represented (9.5%) of the patients. Non caseative granuloma was found in three of the patients. In four studied lymph nodes Leishman Donovan bodies were present. 7.5% of lymphadenopathies occurred in HIV patients with no histological features of TB.

4. DISCUSSION

In this study, cervical nodes were by far the most frequently affected group of lymph nodes constituting 69.4% of the studied nodes. This is consistent with literature from outside Sudan, with a slightly higher incidence in Red Sea State (Pindiga et al., 1999; Getachew et al., 1999). The preponderance of cervical lymphadenopathy may be related to its location near a common primary site of infections and malignancy that are drained through this single channel (the cervical lymph nodes).

Tuberculosis has been reported by several authors as the predominant cause of lymph node enlargement in adults in the tropics (Obafunwa et al., 1992; Thomas et al., 1995). This was also the finding in this study with tuberculous lymphadenitis constituting 39.5% of cases. The high incidence of tuberculosis has been attributed to the low socio-economic status, drinking of raw milk and the attendant poor standard of living in the third world countries (Narang et al., 2005). Kheriy et al. (1992) reported high level of TB in cervical lymph nodes (49%) in Khartoum, Sudan. Their study was done in a referral center to all peripheral regions of Sudan; this may explain their high result rate. The incidence of tuberculous lymphadenitis in the studied area is comparable to Nigeria (Adeniji et al., 2000) but much lower than 47.8% in Ethiopia (Getachew et al., 1999) and 52% in Zambia (Bem et al., 1996). The higher rate of tuberculous lymphadenitis in some African countries like Zambia is due to their higher HIV infection rates, tuberculosis being an AIDS-defining illness (Bem et al., 1996). In the last two decades, HIV/AIDS has also been responsible for the resurgence of tuberculosis in the Western world (Cotran et al., 1999).

Table 1: Anatomical sites of the enlarged lymph nodes in the studied patients

Pathological Change	Generalized	Cervical	Axillary	Inguinal	Others	Total (%)
Reactive lymph nodes	6	7	1	16	1	31 (9.5)
Tuberculosis	0	120	7	2	0	129 (39.5)
Metastasis	0	53	20	8	0	81 (24.7)
Non Hodgkin's lymphoma	9	30	4	4	0	47 (14.4)
Hodgkin's lymphoma	0	5	1	1	0	07 (2.2)
Sarcoidosis	1	2	0	0	0	03 (0.9)
Visceral leishmaniasis	4	0	0	0	0	04 (1.2)
HIV (non tuberculous)	5	10	7	2	1	25 (7.6)
Total (%)	25 (7.7)	227(69.4)	40 (12.2)	33 (10.1)	02 (0.6)	327(100)

Table 2: Pathological changes in the lymph nodes in the different genders and ages of the patients

Pathological Change	Males (%)	Females (%)	15-20 years	20-30 years	30-40 years	40-50 years	50-60 years	60-70 years	> 70 years	Total (%)
Reactive lymph nodes	13	18	26	4	1	0	0	0	0	31 (9.5)
Tuberculosis	51	78	10	12	66	22	14	3	2	129 (39.5)
Metastasis	48	33	0	0	0	6	60	13	2	81 (24.7)
Non Hodgkin's lymphoma	15	32	7	17	12	8	2	1	0	47 (14.4)
Hodgkin's lymphoma	2	5	0	1	1	4	0	1	0	07 (2.2)
Sarcoidosis	1	2	0	0	0	2	1	0	0	03 (0.9)
Visceral leishmaniasis	4	0	0	1	1	1	1	0	0	04 (1.2)
HIV (non tuberculous)	13	12	10	9	4	2	0	0	0	25 (7.6)
Total	129 (39.4)	198 (60.6)	53	44	85	45	78	18	4	327 (100)

In this research, metastasis from malignant tumors constituted 24.7 % of cases. Kheriy et al. (1992) reported (18.6%) in the center of Sudan. They have low incidence of metastatic nodes because their work was only confined to the cervical nodes. Other important regions, like the axillary nodes which drain high levels of breast cancer, are beyond the scope of their study. Breast cancer involvement of axillary node comprises 24.6% of the nodal metastases in this study. Worldwide (Berg, 1995) and in our region (Ageep et al., 2007) breast cancer is the most common malignant tumor.

Collectively, lymphomas were the third most prevalent cause of palpably enlarged peripheral nodes accounting for 16.6% which is similar to 16.4% in Khartoum (Kheriy et al., 1992). Among the lymphomas, non-Hodgkin lymphomas (NHL) were more common comprising 14.4% of histologically diagnosed lymphadenopathies. In the western world non-Hodgkin lymphoma (NHL) is reported to be three to four times more common than Hodgkin's lymphoma and the incidence of NHL is rising while that of Hodgkin's lymphoma is falling (Hartge et al., 1994). The much higher proportion of NHL in the Western world than here in Africa may be partly explained by racial and genetic factors as comparative studies in the United States document higher incidence among Caucasian than African-American particularly for low grade follicular lymphomas (Hartge et al., 1994).

In this report, non specific reactive lymphadenopathy constituted 9.5% of the cases. This picture is so different from the United States, since reactive hyperplasia of the lymph nodes represents nearly 50% of the cases (Henry, 1998). The relative absence of tuberculosis and earlier diagnosis of malignancies before the onset of nodal metastases may explain the prominence of reactive hyperplasia in the Western world.

The main techniques used in this research were histopathological study of the excised nodes and the FNAC. FNAC has the advantages of the low cost; the short time to have a diagnosis and the fewer invasions to the patients, but still it needs expert persons to interpret its results. The former technique has high level of accuracy with adequate tissue examination, but more time is consumed in this procedure. So our protocol is to use FNAC as a first line investigation for peripheral lymphadenopathies and to request surgical biopsies in selected patients whenever the diagnosis is not fully made by FNAC.

5. CONCLUSIONS

Tuberculosis is the most common cause of lymphadenopathy in Red Sea State. Still, high levels of metastatic nodes and lymphomas are present. Hence, the empirical use of anti-tuberculous therapy without histological diagnosis may cause a delay in the diagnosis of malignancy. However, the institution of Fine needle aspiration cytology would significantly enhance early diagnosis and thus, the timely institution of appropriate treatment protocols.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Adelusola, K.A., Oyelami, A.O., Odesanmi, W.O., Adeodu, O.O. (1996). Lymphadenopathy in Nigerian children. *West Afr J Med*, 15, 97-100.

- Adeniji, K.A., Anjorin, A.S. (2000). Peripheral lymphadenopathy in Nigeria. *Afr J Med Med Sci*, 29, 233-237
- Ageep, A.K., Ali, B.M., Awadelkarim, M.A. (2007). Pattern and Incidence of Cancer in Red Sea State, Sudan. *Sudan Journal of Medical Sciences*, 33-35
- Alvarez, S., McCabe, W.R. (1984). Extrapulmonary tuberculosis revisited: a review of experience at Boston City and other hospitals. *Medicine (Baltimore)*, 63, 25.
- Bem, C., Patil, P.S., Bharucha, H., Namaambo, K., Luo, N. (1996). Importance of HIV associated lymphadenopathy and tuberculous lymphadenitis in patients undergoing lymph node biopsy in Zambia. *Br J Surg*, 83, 75-78
- Berg, J.W., Hutter, P.V. (1995). Breast cancer. *Cancer*, 75(suppl), 257-269.
- Cotran, R.S, Kumar V., Collins, T. (1999). Tuberculosis in: *Robbin's pathologic basis of disease*. Saunders, Philadelphia, 349- 351
- Dandapat, M.C., Mishra, B.M., Dash, S.P., Kar, P.K. (1990). Peripheral lymph node tuberculosis: a review of 80 cases. *Br J Surg*, 77, 911.
- El-Sony, A.I., Khamis, A.H., Enarson, D.A., et al. (2002). Treatment results of DOTS in 1797 Sudanese tuberculosis patients with or without HIV co-infection. *Int J Tuberc Lung Dis.*, 12, 1058-66.
- Ferrer, R. (1998). Lymphadenopathy: differential diagnosis and evaluation. *Am Fam Physicia*, 58, 1313-1320.
- Getachew, A., Demissie, M., Gemechu, T. (1999). Pattern of histopathological diagnosis of lymph node biopsies in a teaching hospital in Addis Ababa 1981-90. *Ethiopian Medical Journal*, 37, 121-127.
- Hartge, P., Devessa, S.S., Fraumeni, J.F. (1994). Hodgkin's and non-Hodgkin's lymphoma. *Cancer Surv*, 19-20, 423-433.
- Hashim, M.S., Salih, M.A., el Hag, A.A. et al. (1997). AIDS and HIV infection in Sudanese children: a clinical and epidemiological study. *AIDS Patient Care STDS*, 5, 331-7.
- Henry, P.H., Longo., D.L. (1998). Enlargement of lymph node and spleen. In: *Harrison's principles of internal medicine*. McGraw-Hill, New York, 345-347.
- Hill, A.R., Premkumar, S., Brustein, S., et al. (1991). Disseminated tuberculosis in the acquired immunodeficiency syndrome era. *Am Rev Respir Dis*, 144,1164.
- Kheriy, J., Ahmed, M.E. (1992). Cervical lymphadenopathy in Khartoum. *J Trop Hyg*, 95(6), 409-416
- Lake, A.M., Oski, F.A. (1978). Peripheral lymphadenopathy in childhood. Ten-year experience with excisional biopsy. *Am J Dis Child*, 132, 357-9.
- Lau, S.K., Wei, W.I., Hsu, C., Engzell, U.C. (1998). Efficacy of FNAC in the diagnosis of TB cervical lymphadenopathy. *Bri Med J*, 79-82.
- Lee, Y.T., Terry, R., Luke, R.J. (1982). Biopsy of peripheral lymph node. *Am Surg*, 48,536-539
- Narang, P., Narang, R., Narang, R., Mendiratta, D.K., Sharma, S.M., Tgagi, N.K. (2005). Prevalence of tuberculous lymphadenitis in children in Wardha district, Maharashtra State, India. *Int J Tuberc Lung Dis*, 9, 188-94.
- Peto, H.M., Pratt, R.H., Harrington, T.A., et al. (2009). Epidemiology of extrapulmonary tuberculosis in the United States, 1993-2006. *Clin Infect Dis*, 49,1350.
- Pindiga, U.H., Dogo, D., Yawe, T. (1999). Histopathology of primary peripheral lymphadenopathy in northeastern Nigeria. *Nigerian Journal of Surgical Research*, 1, 68-71
- Obafunwa, J.O., Olomu, L.N., Onyia, N.J. (1992). Primary peripheral lymphadenopathy in Jos, Nigeria. *West Afr J Med*, 11, 25-8.
- Ochicha., O. et al. (2007). Pathology of peripheral lymph node biopsies in Kano, Northern Nigeria. *Annals of African Medicine*, 6(3), 104-108.

- Okolo, S.N., Nwana, E.J., Mohammed, A.Z. (2003). Histopathologic diagnoses of lymphadenopathy in children in Jos, Nigeria. *Niger Postgrad Med J.*, 10, 165-7.
- Rieder, H.L., Snider, D.E. Jr., Cauthen, G.M. (1990). Extrapulmonary tuberculosis in the United States. *Am Rev Respir Dis*, 141, 347.
- Rosai, J. (1996). Lymph nodes. In: Ackerman's surgical pathology. Mosby, St. Louis, 1662-1670.
- Thomas, J.O., Ladipo, J.K., Yawe, T. (1995). Histopathology of lymphadenopathy in a tropical country. *East Afr Med J*, 72, 703-5.

© 2012 Ageep; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.