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Research Article

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Cytological and histological characterization of lymphadenopathies using needle aspiration and biopsy among patients attending the pathology clinic of AIC Kijabe hospital

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Keywords

Lymphadenopathy, cytological and histopathological, Biopsy.

Abstract

Background: Lymphadenopathy is the disease process of the lymph nodes that rendering them abnormal in size and consistency. Lymphadenopathies that can be localized or widespread are usually noticed by the enlargement of specific or generalized lymph nodes in the body. Therefore, the cytological and histopathological characterization of Lymphadenopathy is of considerable clinical importance in the early detections and in making accurate diagnosis of different forms of cancers. **Objectives:** To determine the histological and cytological characterization of lymphadenopathy in pathology laboratory of AIC Kijabe Hospital, Kenya. **Design:** Cross section study design. **Setting:** AIC Kijabe Hospital, Kiambu County, Kenya. **Subjects:** One hundred and forty seven (147) lymph nodes were analyzed of which 102 were examined histologically and 45 were analyzed cytologically. **Results:** Out of 102 lymph nodes analyzed histologically, 29 (28.4%) were reactive, 28 (27.5%) were malignant, 19 (18.6%) were granulomatous, 16 (15.7) were lymphoma and 10 (9.8%) benign lymphadenopathy. Out of 45 fine needle aspirates that were performed, 15 (33.3%) were reactive lymph nodes, 9 (20%) were malignant, 4(8.9%) were granulomatous, 3(6.7%) were lymphoma, 3 (6.7%) were benign and 11(24.4%) were non-diagnostic. These results showed high numbers of malignant lymphadenopathy both metastases and lymphoma followed by reactive lymph nodes. Nine cases of lymphadenopathy were compared histologically and cytologically for purpose of determining the sensitivity of fine needle aspiration technique in diagnosing lymphadenopathy. **Conclusion:** Although both methods can be used in diagnosis of a condition, cytology is faster, cheaper and less traumatic as compared to biopsy. Use of ultrasonography guided images can help to locate deep-seated lymph nodes to facilitate easy sampling by use of fine needle aspirate. This can reduce non-diagnostic value. The histological technique was found superior as there is no non-diagnosis material which was examined in histology.

Introduction

Lymphadenopathy is the disease process of the lymph nodes that rendering them abnormal in size and consistency (JalalA. And Eltahir, 2012). Lymphadenopathies that can be localized or widespread are usually noticed by the enlargement of specific or generalized lymph nodes in the body (Walker HK *et al* 1990).Therefore, the cytological and histopathological characterization of Lymphadenopathy is of considerable clinical importance in the early detections and in making accurate diagnosis of different forms of cancers. It is however notable that the distinction between lymphadenopathy and lymphadenitis is rarely made in the clinical practice and this has made management of cancers particularly in African continent difficult. This problem has been compounded by lack of African based data on histopathological and cytological parameters of lymphadenopathies that can be used as a bench mark to help the clinical pathology in the African continent to make accurate diagnosis of cancer related lymphadenopathies among selected populations. The broad objective of this study therefore was to generate data on histological and cytological characterization of lymphadenopathies that would be used as a bench mark in distinguishing lymphadenopathies as a tool in helping clinical pathologists in making early and accurate diagnosis of various forms of cancers in Kenya. The study greatly helped in proper diagnosis of the diseases in AIC KIJABE hospitals, and also helps to improve utilization of FNAC in the early disease diagnosis of diseases affecting lymph nodes.

Materials and Methods

A cross section study design was used to collect the data; convenient sampling method was used to get the sample size. This included the entire group of patients who had enlarged lymph nodes and those their lymph nodes were sent in the laboratory together with the biopsy.

One hundred forty-seven (n=147) samples of enlarged lymph node were processed, 102 of these samples were biopsies which were analyzed histologically, and 45 samples were analyzed by taking the fine needle aspirate for cytology. Convenient sampling method was used to get the sample size. This included the entire group of patients who were eligible for the study according to inclusion criteria.

The slides for cytology were fixed using 70% alcohol and sent to the laboratory. All the slides were stained using the Haematoxylin and Eosin staining technique, and then examined by the researcher and the diagnosis confirmed by the Pathologist in the AIC Kijabe Hospital. The diagnoses were made using the cytomorphological and histomorphological characteristic and data analysed accordingly.

Institutional approval of the study was sought from AIC Kijabe Hospital research and training board. Ethical clearance was obtained from the Mount Kenya University research and ethical committee (Ref. No. MKU/ERC/). All information and data obtained from the patient who consented and was treated with utmost confidentiality and used for research purposes only.

Results and Data Analysis

Figure 1a

Figure 1b

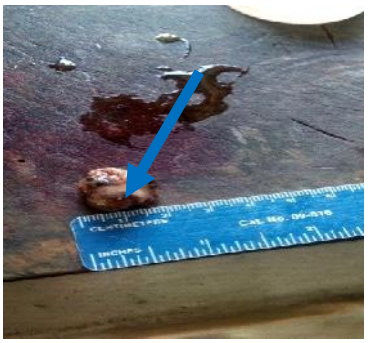


Figure 1c

Figs 1a, 1b and 1c: Gross view of enlarged lymph nodes. Their consistency varied, which helped in choosing the lymph nodes for histological study. Cytological the examination was done on lymph nodes in situ and approximately measured 2cm in diameter.

In Table below, shown the cases which were diagnosed in the hospital. Histological cases that were diagnosed as reactive lymphadenopathy were 29, followed by malignant 28, granulomatous were 19, lymphoma were 15 and benign were 10.

Table 1. Number of Histological Characterizations

Character	Number of cases
Reactive lymphadenopathy	29
Malignant lymphadenopathy	28
Granulomatous necrotizing	19
Lymphoma	16
Benign	10

Percentages of the characterizations identified histologically where, the reactive lymphadenopathy has the highest percentage at 28.4%, followed by malignant lymphadenopathy at 27.5%, granulomatous at 18.6%, lymphoma at 15.7% and benign with 9.8%.

Table 2. Cytological Characterizations of Lymphadenopathy

Characterizations	Number of cases
Reactive lymphadenopathy	15
Malignant lymphadenopathy	9
Granulomatous lymphadenopathy	4
Lymphoma	3
Benign lymphadenopathy	3
Non –diagnostic lymphadenopathy	11

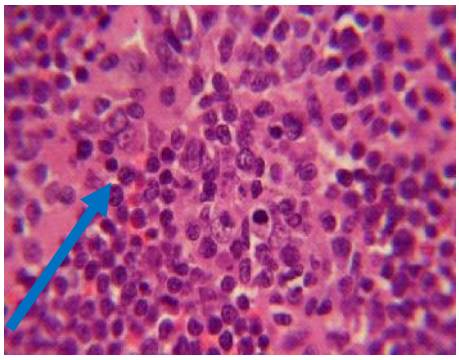
Different cytological characterizations diagnosed using the fine needle aspirate for the period of one year from March 2015 to March 2016 at AIC Kijabe Hospital. Reactive lymph nodes were the leading, followed by non-diagnostic, malignant, granulomatous, lymphoma and benign the last character in the diagnosis.

The comparison of the different characterizations as determined under microscope, both histological and cytological. Reactive lymph node is the leading characterizations in both methods.

Table 3. Comparison Between Histology and Cytology

Character	Histology	Cytology
Reactive lymphadenopathy	28.4%	33.3%
Malignant	27.5%	20%
Granulomatous	18.6%	8.9%
Lymphoma	15.7%	6.7%
Benign	9.8%	6.7%
Non -diagnosis	0%	24.4%

Figure 2. Differentiation of characteristics of histological and cytological presentation of lymphadenopathy in the same patients



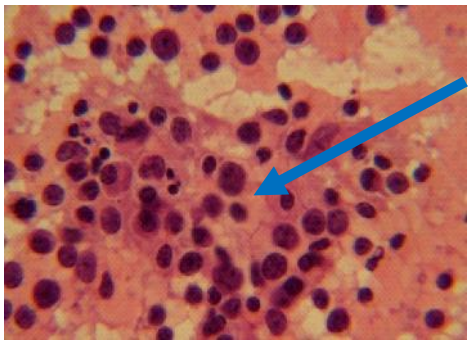
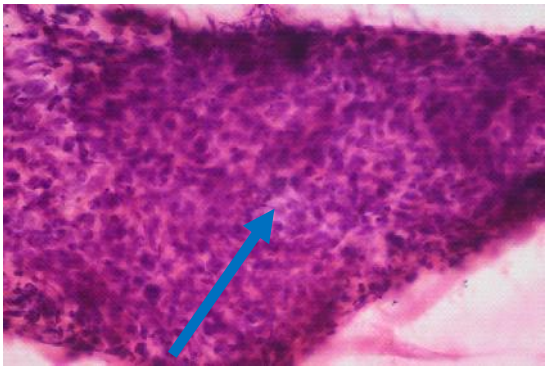
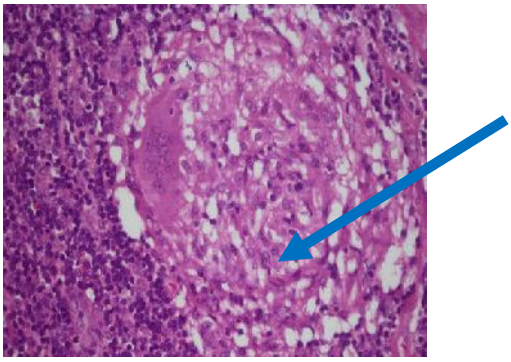


Figure 2 Reactive lymph node(Histology) 1b **Figure 2**Reactive lymph node (cytology)1a

Photomicrographs 1a and 1b show cytology and histology of lymph node respectively from a patient with history of neck swelling for one month



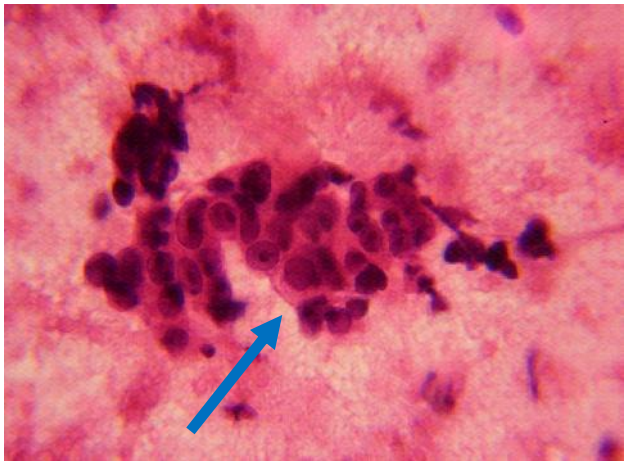
Necrotic background and granuloma 2a (cytology)



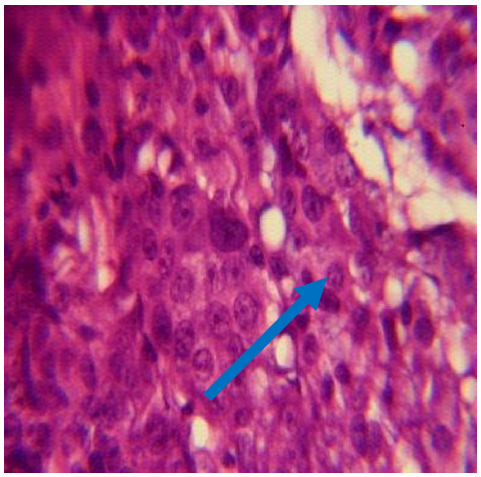
Necrotic granuloma2b(Histology)

Photomicrographs 2a and 2b, show cytology and histology of patient with history of clinical posterior neck lymphadenopathy for 16wks.

The photomicrographs 3a and 3b show cytological and histological view of lymphadenopathy respectively in a patient with suspected cancer of right breast; has enlarged axillary lymph node. FNA and biopsy were done.

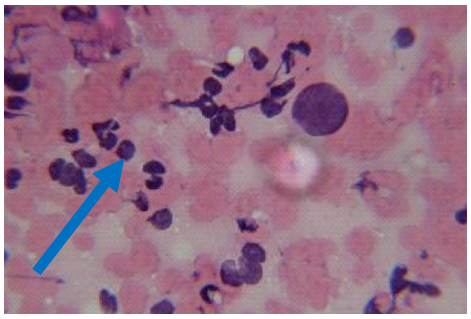


Cytology Metastatic cancer (breast) 3a

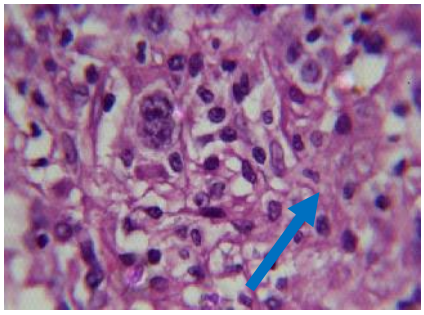


Histology of Metastatic cancer (breast) 3b

Photomicrographs 4a and 4b represent cytology and histology respectively of left side lymph node enlargement in a patient at AIC KIJABE.



Cytology of Lymphoma 4a



Histology of lymphoma (Reed stein cell) 4b

Discussion

The histological and cytological characterizations of the lymph nodes were done at AIC Kijabe Referral Hospital, Kenya that attends to a large number of patients in the region. The research was based on studies of histological and cytological characterizations of the lymph nodes which were obtained from the Surgical Clinic of the hospital, and processing was done in the Pathology Laboratory with the help of the Pathologist and the researcher himself to collect the data and help in diagnoses.

According to the study, histological study was done by help of excision biopsy while cytological study was done using the FNA technique. There were few cases which was done both histologically and cytologically of the same clients who were on follow-up in the clinic of surgical. The histological cases were 102 cases and cytological cases were 45 cases in the year of study.

Out of 102 excision lymph node, 28.4% reactive lymph node, 27.5% malignant lymph nodes, 18.6% granulomatous, 15.7% lymphoma and 9.8%benign. This study shows that there is higher numbers of malignant lymph nodes whereby both lymphoma and malignant account for 43.2% compared with study done by Thomas *el., al* (1995)under study to determine the histopathology of lymphadenopathy in Tropical countries, which was 35.5% .This is also compared to study done at Nepal Medical College where the reactive lymph nodes were 36%, Granulomatous 49% and metastasis 11% on study titled Histopathologal diagnosis of lymph node biopsies by Tiwar.*et al* (2007).This shows high rate of malignant lymphadenopathy in a developing country. The study is supported by the research which was done at Maharat Nakhon Hospital using lymph node biopsies for histopathologic diagnosis (Narida *et al* 2012) which included that, metastatic carcinoma was the most common cause of lymphadenopathy. This corroborates study done at Kijabe hospital.

The cytological characterization was done using Fine Needle Aspiration technique, whereby a total of 45 lymph nodes were aspirated. Reactive lymph node were 33.3%, malignant 20%, granulomatous 8.9, lymphoma 6.7%, benign 6.7% and non- diagnostic 24.4%.This study shows that most of the lymph node are enlarged as a result of reaction to different agents which include infection, immunity or as a result of process of malignant. There is still a significance percentage that shows malignancy, as it occupy 26.7%, both lymphoma and metastatic from other regions such as breast cancer. There is a significance percentage of 24.4% of non-diagnostic materials, this is attributed by sampling errors which includes, small or deep- seated lymph node, Nodal fibrosis, excessive inflammation and also present of blood.

The study shows difference with some other study which had been done. Example is a study which was done in Peshawar department of postgraduates, Tuberculous lymphadenitis was the commonest (36%),followed by reactive lymphadenitis(18%), malignant 14%, benign 8%(Rajesh *et al* 2010).This study is supported by the study which was done in Rupali Bargotra. This study highlights the usefulness of FNAC as a reliable method for diagnosis of cervical lymphadenopathy even in tertiary care in medical college hospital. The most frequent causes of cervical lymphadenopathy are reactive lymphadenitis, tuberculosis and metastatic malignancies. In large number of cases FNAC alone is enough for diagnosis in proper clinical setting and surgical procedures like biopsy can be avoided even in tertiary care (Bandopadhyag et al 1996).

There were 8 cases which was done both biopsy and also the fine needle aspiration, from the same patients in the hospital. Fine needle aspirate were taken first and later biopsy was taken. The diagnoses made from both fine needle aspirate and the histological were the same. This shown high rate of accuracy of the fine needle aspirate in diagnosis of diseases.

Conclusion

From the study, it is concluded that:

Reactive/non-specific lymphadenopathy is the leading character in both histology and cytology study.

There is increase in malignancy lymph node in the Region as compared to other study done in developed worlds.

Most of malignant lymph node is due to metastasis of cancers from other site such as Breast cancer, seconded by lymphoma.

Recommendations

There should be use of more fine needle technique in the facility to increase more diagnosis of lymphadenopathy at low cost and to avoid patient to undergo the procedure of unnecessary surgery, which is expensive and time consuming and traumatizing to patient.

There should be use of image guided to perform fine needle aspiration technique to more deep-seated lymph node, to increase diagnosis of diseases.

More machines should be put in place for immunotyping of the cancer of lymph node such as lymphoma.

More cytologist and cytopathologist should be trained to increase the diagnosis especially during this time there is increase in rate of cancer diseases.

More research should be done to increase and support of this study and also to increase the awareness in the entire region or country.

There should be training of the public on important of attending hospital early to increase early diagnosis, leading to early management, and decrease the rate of metastases of cancer disease.

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