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RESEARCH ARTICLE

FINE NEEDLE ASPIRATION CYTOLOGY OF LYMPHADENOPATHY AMONG
SUDANESE ADULT PATIENTS

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ABSTRACT

Study design and Objective: This was a cross sectional retrospective study aimed to identify frequency and classify lymphadenopathy in adult Sudanese patients investigated by fine needle aspiration cytology.

Methods: Fine needle aspirates were obtained from 639 patients having enlarged lymph nodes, stained by Pap stain and assessed under a light microscope. Data and findings were analyzed using SPSS program version 16.

Results: From the 639 cases, 361 were benign and 278 were malignant with predominance of metastatic cancer.

Conclusion: Lymphadenopathy in Sudanese adults can be easily assessed and classified by using fine needle aspiration, as the case in several other populations.

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INTRODUCTION

Lymph nodes comprise an important part of the defense system of the human body, as filters or traps for foreign particles. Lymphadenopathy refers to lymph nodes which are abnormal in size, number or consistency (King et al., 2014). Cause of lymphadenopathy is variable, may range from an infectious process to a malignant disease. Common causes include tuberculosis, cancer, reactive hyperplasia, malignant lymphoma, and pyogenic abscess (Fontanilla et al., 2011; Weiss and O'Malley, 2013; Kennedy, 2013; Lederman and Margolis, 2008; Sagatys and Zhang, 2011). It is difficult to diagnose the cause of lymphadenopathy on the basis of history and physical examination alone; fine needle aspiration cytology (FNAC) has proved to be one of the best methods for diagnostic assessment of enlarged lymph nodes (Prasad et al., 1993; Bhuyan et al., 2008; Shilpa and Nataraju, 2013; Paul et al., 2004). That is because of its cost effectiveness, simplicity, accuracy, safety, and quickness; furthermore, it reduces the need for surgical biopsy (Gupta et al., 1991).

Lymphadenopathy is becoming a common pathological problem in most parts of the world and several studies have been done to assess the extent of the problem (Friedmann, 2008; Muluye et al., 2013; Sriwatanawongsa et al., 1985). It is an important clinical manifestation of regional or systemic disease which serves as an excellent clue to the underlying disease. Clinical presentation of lymph node enlargement may be acute painful or chronic painless swelling; this depends on nature, dose, and duration of the causative agent (Pangalis et al., 1993).

Aim of this study was to discuss frequency and distribution of lymphadenopathy in fine needle aspirates obtained from Sudanese adults during a period of two years.

MATERIALS AND METHODS

This was a cross-sectional retrospective study conducted to assess pattern of Lymphadenopathy in Sudanese adults. Institutional ethical clearance was obtained from Research Ethics Committee of faculty of medical laboratory sciences, university of Khartoum and permission to patients' data was obtained from head of pathology department of Total Lab Care

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Center at Khartoum city. Participants in this study were 639 patients with lymphadenopathy referred to Total Lab Care Center (TLCC) during the period between January 2013 and September 2014. Fine needle aspirates were obtained from all patients using one FNA pass and no complications were noticed. Frequency distributions and cross tabulations were conducted to determine frequency or pattern of the enlarged lymph node of the studied cases. Statistical evaluation was done using the Statistical Package for Social Sciences (version 16.0).

RESULTS

Patients included in the study were 402 (62.9%) females and 237 (37.1) males, with age range from 18 years to 90 years; the mean age was 44 years. Sites aspirated included 302 aspirates (47.3 %) from cervical lymph nodes and 172 aspirates (26.9%) from axillary lymph nodes (Table 1).

Table 1. Sites of benign or malignant lymphadenopathy and their numbers

| Site of lymphadenopathy | Number of benign lesions | Number of malignant lesions | Total number |
|-------------------------|--------------------------|-----------------------------|--------------|
| Neck (cervical) | 189 | 113 | 302 |
| Axillary | 81 | 91 | 172 |
| Inguinal | 13 | 17 | 30 |
| Supraclavicular | 25 | 30 | 55 |
| Submandibular | 30 | 5 | 35 |
| Submental | 12 | 3 | 15 |
| Generalized | 10 | 20 | 30 |
| Total | 360 | 279 | 639 |

The age group "18 – 36" was the most affected by lymphadenopathy than the other age groups (Table 2).

Considering benign and malignant lesions, most of benign lesions were within the age group (18-36) and most of malignant lesions were within the age group (37-54); this is shown in Table 3.

Of the 402 females in the study, 238 (37%) have benign lesions and 164 (26%) have malignant lesions. In males, 122 (19%) have benign lesions and 115 (18%) have malignant lesions.

Benign lesions (360 lesions) included 235 (37%) reactive hyperplasia or acute suppurative infection and 125 (20%) were tuberculous lymphadenitis.

Out of the 279 malignant cases, 204 were metastatic carcinoma, 54 were Non Hodgkin lymphoma, 14 were Hodgkin lymphoma, and 7 were leukemia. Distribution of malignant lesions within age groups is shown in Table 4.

DISCUSSION

Fine needle aspiration cytology is a simple and safe diagnostic procedure; it is cost effective, time saving, and accurate (Hafez and Tahoun, 2011; Steel *et al.*, 1995). Lymphadenopathy is common and requires prompt and accurate diagnosis so that a proper treatment protocol can be started as early as possible. The pattern of lesion in current study varied from non-neoplastic lesions such as tuberculosis lymphadenitis to neoplastic lesions such as metastatic carcinoma. Localized lymphadenopathy was the most common presenting feature than generalized lymphadenopathy; in this study, cervical lymph nodes were most commonly involved (47.3%) followed by axillary lymph nodes (26.9%). Muluye *et al.* (2013) examined 3,440 lymph node aspirates at Northwest Ethiopia, 47.5% of them were from the cervical region followed by axillary lymph nodes (19.4%). Collectively, benign lesions (360 cases) were most common than malignant lesions (279 cases) in the present study.

Table 2. Distribution of Lymphadenopathy within age groups

| Age-group | Number of patients | Percentage |
|------------------|--------------------|------------|
| (18-36) years | 249 | 39% |
| (37 to 54) years | 213 | 33% |
| (55 to 72) years | 138 | 22% |
| (73 to 90) years | 39 | 6% |
| Total | 639 | 100% |

Table 3. Distribution and frequency of benign and malignant lesions within age groups

| Age-group | No and % of benign lesions | No and % of malignant lesions | Total |
|------------------|----------------------------|-------------------------------|------------|
| (18-36) years | 191 (30%) | 58 (9%) | 249 (39%) |
| (37 to 54) years | 101 (16%) | 112 (18%) | 213 (34%) |
| (55 to 72) years | 54 (8%) | 84 (13%) | 138 (21%) |
| (73 to 90) years | 14 (2%) | 25 (4%) | 39 (6%) |
| Total | 360 (56%) | 279 (44%) | 639 (100%) |

Table 4. Distribution of malignant lesions within age groups in the study

| Age-group | Metastatic carcinoma | Non Hodgkin lymphoma | Hodgkin lymphoma | Leukemia | Total |
|------------------|----------------------|----------------------|------------------|----------|-------------|
| (18-36) years | 42 (15%) | 10 (3.6%) | 7 (2.5%) | 1 (0.4%) | 60 (21.5%) |
| (37 to 54) years | 86 (30.8%) | 19 (6.8%) | 4 (1.4%) | 2 (0.7%) | 111 (39.7%) |
| (55 to 72) years | 59 (21.1%) | 18 (6.5%) | 2 (0.7%) | 3 (1.1%) | 82 (29.4%) |
| (73 to 90) years | 17 (6.1%) | 7 (2.5%) | 1 (0.4%) | 1 (0.4%) | 26 (9.4%) |
| Total | 204 (73%) | 54 (19.4%) | 14 (5%) | 7 (2.6%) | 279 (100%) |

These benign lesions included 235 (37%) reactive hyperplasia or acute suppurative infection and 125 (20%) tuberculous lymphadenitis. This correlates well with other studies from India and other developing countries. Ahmad *et al.* (2005) examined lymphadenopathy in Indian patients and found 86.4% of the involved lymph nodes were benign lesions. In other studies from Pakistan, Khan *et al.* (2011) reported 92% benign lesions and Fatima *et al.* (2011) reported 73.2% benign lesions with the predominant cause of enlarged neck nodes was tuberculous lymphadenitis (52.7%) followed by reactive lymphadenitis (16.1%).

Regarding the malignant cases in this study (279 cases), 73% were metastatic carcinoma (204 cases). Steel *et al.* (1995) reported 53.8% of malignant lymphadenopathy was metastatic carcinomas and Alam *et al.* (2010) reported 80.4%. In this study, 19.4% of malignant lesions were Non Hodgkin lymphoma and 5% were Hodgkin lymphoma. This correlates with findings of Egea *et al.* (2002) who reported that 9.5 % of their cases were lymphoma. Regarding size of the affected lymph nodes, lymphadenopathy is classically described as a node larger than 1 cm. There is no uniform nodal size at which one should become suspicious of a neoplastic etiology. In this study, sizes less than 4 cm were more frequent in benign lesions while sizes more than 5 cm were more frequent in malignant lesions. Slap *et al.* (1984) reported maximum diameter of more than 2 cm as an appropriate starting point for high suspicion of malignant or granulomatous disease. Increasing size and persistence over time are of greater concern for malignancy than a specific level of nodal enlargement. Most of benign lesions were within the age group (18-36) and most of malignant lesions were within the age group (37-54) and older. This is consistent with the report of Hines *et al.* (2001), which stated that about 80% of patients less than 30 years of age have benign cause of their lymphadenopathy, while in about 60% of those older than 50 years the underlying cause is malignancy.

Conclusion

Lymphadenopathy can be associated with a wide range of disorders, however; tuberculous lymphadenitis is the most common cause of enlarged benign lymph node in the study area. FNAC can be regarded as first line approach to such palpable lymph nodes. It has many advantages which make it suitable for use on outpatient basis, in peripheral hospitals and dispensaries, thus reducing the incidence of surgery and, therefore, bed occupancy.

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