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FINE NEEDLE ASPIRATION CYTOLOGY OF THYROID NODULES AT KENYATTA NATIONAL HOSPITAL, NAIROBI

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ABSTRACT

Objective: To determine the pattern of thyroidal nodules diagnosed by (FNA) cytology.

Design: A cross-sectional study.

Setting: Kenyatta National Hospital (KNH) - a University of Nairobi affiliated hospital.

Subjects: Forty two patients seen at FNA clinic at KNH between June and August 2001.

Results: The female to male ratio was 7:1, with the majority in the age group 31-50 years. Overall 88.1% patients had benign FNA cytologic diagnostic results, 2.4% had a malignant, and a suspicious result respectively and 7.1% were non-diagnostic. Cytological results were as follows, nodular goiter comprised 83.3%, non-diagnostic samples 7.1%, papillary carcinoma 2.4%, atypia 2.4%, thyroglossal cyst 2.4%, and thyroiditis 2.4%.

Conclusion: The findings are comparable in terms of sex, age and FNA cytologic diagnostic results to other studies. FNA cytology offered clinicians the possibility of early diagnosis of benign (>70%) and malignant (<5%) lesions. The test was an out-patient procedure, safe, time saving, cost effective and helped determine the course of therapy in the management of patients with thyroid nodules.

INTRODUCTION

Diseases of the thyroid gland usually result in thyroid enlargement (goiter) which can be due to infections, cystic changes, autoimmune diseases, iodine deficiency leading to hyperplasia and neoplasia, with or without thyroid hyperfunction (hyperthyroidism) or thyroid hormone deficiency (hypothyroidism). The prevalence of goitre in many countries is in the range of 4–10% of the general population upon neck examination and up to 50% of autopsy cases (1). Although the presence of a nodule raises suspicion for cancer, only about 5% are malignant (2).

The methods currently used for assessing thyroid nodules include, fine needle aspiration (FNA)

cytology, radionuclide scanning, ultrasonography and histopathology. Practice guidelines suggest that an initial FNA is cost effective and reliable and is now believed to be the most effective pre-operative method available for distinguishing between benign and malignant thyroid nodules (3). Cytopathology laboratories should use standardised reporting of FNAs. The simplest approach uses four diagnostic categories namely benign, malignant, indeterminate/suspicious, and unsatisfactory/inadequate. The main aim of this study will be to determine the cytologic diagnosis of thyroid nodules seen at Kenyatta National Hospital (KNH). This should help achieve meaningful comparisons among different laboratories regarding outcomes (4).

MATERIALS AND METHODS

Study design and site: This was a cross-sectional study of forty two patients seen at the thyroid and FNA clinic at KNH between June and August 2001.

Inclusion and exclusion criteria: Patients were included if they had a nodular or diffuse thyroid goiter, and had a request for FNA by the attending clinician. Any patient who was on treatment for a thyroid disorder was excluded.

Ethical considerations: Ethical approval was obtained from the research and ethics committee of KNH and informed consent from the patient before data collection.

FNA cytology: Fine needle aspiration biopsy of the thyroid gland was done and four smears for each patient was immediately fixed in 95% ethanol at the FNA clinic. A laboratory request form was filled with the relevant details and sent to the cytology laboratory where two slides were stained with regressive Papanicolaou technique and the remaining two slides were stained using standard haematoxylin and eosin technique. The slides were examined and a cytological diagnosis was confirmed by the cytopathologist at the Department of Human Pathology, KNH.

RESULTS

During the study period a total of 42 new patients were seen at the thyroid and FNA Cytology clinic, KNH. The majority of the patients were in the age group 31-40 years (Table 1). Table 2 shows that 37 (88.1%) of the patients were females, and five (11.9%) were males giving a female to male ratio of 7:1.

Table 1

Complete distribution for the variable age

Age	Frequency (%)	Relative frequency (%)
<20	1	2.4
21-30	11	26.2
31-40	14	33.3
41-50	12	28.6
51-60	3	7.1
>60	1	2.4
Total	42	100

Table 2

Complete distribution for the variable sex

Sex	Frequency (%)	Relative frequency (%)
Female	37	88.1
Male	5	11.9
Total	42	100

Ratio female: male 7:1

Overall 37 patients (88.1%) had benign FNA cytologic diagnostic results, one (2.4%) had a malignant and a suspicious result respectively and three (7.1%) were non-diagnostic (Table 3).

Patients with nodular goitre comprised 35 (83.3%), non-diagnostic samples, three (7.1%), and one (2.4%) papillary carcinoma, one atypia, one thyroglossal cyst, and one thyroiditis (Table 4). No patient had a cytological diagnosis of Hashimoto's thyroiditis, subacute thyroiditis, follicular carcinoma, medullary carcinoma, anaplastic carcinoma, malignant lymphoma and metastatic carcinoma.

Table 3

Distribution of benign, suspicious/non – diagnostic and malignant FNA cytologic diagnoses

FNA cytological diagnosis	Frequency (%)	Relative frequency (%)
Benign	37	88.1
Non-diagnostic	3	7.1
Suspicious	1	2.4
Malignant	1	2.4
Total	42	100

Table 4

Distribution table for FNA cytology (n = 42)

FNA cytology	% Relative frequency
Nodular goitre	83.3
Non-diagnostic	7.1
Papillary carcinoma	2.4
Atypia	2.4
Thyroglossal cyst	2.4
Thyroiditis	2.4
Total	100

DISCUSSION

Nodular thyroid disease has resulted in the proliferation of many diagnostic methods (5). In general these methods involve distinguishing benign from malignant thyroid nodules and determining the presence of hyperthyroidism, euthyroidism and hypothyroidism. These diagnostic methods should be both cost effective and provide quality care to the patient. Thyroidectomy whether total or partial for the diagnosis of a thyroid nodule has never been satisfactory because it requires hospitalisation and is costly. Many diagnostic methods such as thyroid function tests, radionuclide scanning, ultrasonography and FNA biopsy can be ordered for evaluation of thyroid nodules, but their application in all patients with nodules would also be a burden to the health care delivery system. Not all diagnostic methods are necessary or appropriate and for some patients only a limited evaluation is needed (6).

During the study period a total of 42 apparently euthyroid patients were seen. The majority of the patients were in the age group 31–40 (33.3%) and 41–50 (28.6%) years. There were 37 females and five males giving a female to male ratio of 7:1. The age and sex distribution is similar to other studies in Kenya and East Africa (7,8).

In this study 88.1% of the cases were benign, 7.1% of the cases were non-diagnostic, and 2.4% of the cases each were suspicious and malignant respectively. These statistics compare well with other studies (9-11). Several studies have indicated that 70-98% of patients with non-diagnostic FNA biopsies had benign lesions, with a low incidence of neoplasia 5–10% after histopathological diagnosis (12,13).

The most common FNA cytological diagnostic result was nodular goiter (83.3%) followed by non-diagnostic samples (7.1%) and atypia, thyroglossal cyst, thyroiditis, papillary carcinoma (2.4% each) respectively. In spite of the small sample size of 42, the results compare favourably with 1853 thyroid lesions subjected to FNA sampling by Jayaram *et al* (14). Although the FNA procedure is deceptively simple, it takes considerable skill and experience to master the technique. The best results are obtained when a single physician (the cytopathologist) performs the biopsy and interprets the smear. Only cellular smears should be considered diagnostic and inadequate smears should not be evaluated for a diagnosis. A repeat should be recommended.

Various studies show that specificity ranges between 67 to 100% and sensitivity ranges between 78 to 88% (15-17).

In conclusion, all patients with enlarged thyroids should be done FNA with a view to excluding malignancy because it is simple, safe, cost-effective, and allows accurate cytological diagnosis of benign and malignant lesions. This helps in selecting patients who require surgery. Skilful sampling of the lesion should be the aim in order to get a good sample and hence a satisfactory or useful cytological report. This will reduce diagnostic errors such as inadequate material for diagnosis, sampling errors, and cytodiagnostic errors. This calls for increased training of pathologists, cytologists, and laboratory personnel. Overall FNA helped the clinicians determine the course of therapy in the management of patients with thyroid nodules. A suitable study design would be a prospective study where time, resources, personnel and adequate sample size is considered.

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