

# Thyroid Lesions as Diagnosed by Fine-Needle Aspiration Cytology in Uganda: A Five Year Retrospective Study

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## Research Article

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## **Abstract**

## **Background**

Fine needle aspiration cytology of the thyroid gland has proven to be effective in the categorization of thyroid lesions into benign, atypical, suspicious and malignant categories. However only scanty data has been available regarding the prevalence of thyroid lesions in Uganda. This study aimed at classifying thyroid lesions cytologically and to determine their correlation with the social demographic characteristics.

## **Methodology:**

A laboratory based retrospective study involving a review of 170 cases was conducted at MAKCHS pathology department between 2012 and 2016. FNA results were independently categorized into 4 groups in accordance to Bethesda system for reporting thyroid cytopathology. The data collected was entered using Epidata software and exported to SPSS for analysis.

## **Results**

Out of the 170 cases reviewed, 148 (87.1%) were benign, 3 (1.8%) were suspicious for Follicular Neoplasm, 5 (2.9%) were suspicious of malignancy & 14 (8.2%) were malignant. Colloidal nodule (41.2%) was most prevalent lesion among the benign cases, followed by Follicular adenoma (25.3%). Malignant category was dominated by papillary carcinoma (7.1%). The peak age group for benign lesions was 40–49 years whereas the peak age group for malignant lesions was 40–49 years & 50–59 years age group.

## **Conclusion**

The present findings are consistent with those published in other literature with benign lesions showing predominance over the malignant lesions. Sex and age were found to be associated with a specific diagnosis with the females being most affected as well as those in the older groups.

## **Introduction**

Thyroid disorders are the most common endocrine disorders encountered on the African continent with environmental and nutritional factors often implicated in their occurrence [1]. Screening for thyroid lesions, especially enlarged and /or nodular thyroid disease, is done by fine needle aspiration cytology (FNAC) in experienced hands of a cytopathologist; a method proven to be easy, fast and accurate [2]. FNAC is able to detect thyroid neoplasms for surgery and to identify non-neoplastic lesions that may be managed conservatively hence reducing the number of diagnostic thyroid surgeries for thyroid nodules by 50–85% [3]. Whereas this method offers a reliable means of diagnosis in the assessment of thyroid

diseases, its utility in Uganda remains limited and scarce information is available regarding the prevalence of thyroid lesions in this country. This study aimed at documenting the prevalence of different thyroid diseases diagnosed cytologically at MakCHS Lab for half a decade (2012–2016) by reviewing all the thyroid FNA reports over the said period.

## Methods

A retrospective laboratory-based study was conducted on 170 individuals involving a review of FNAC reports for individuals who presented with thyroid nodules between 2012 and 2016 at pathology department of Makerere University College of health sciences. It is located at the Mulago National Referral and Teaching Hospital in Kampala, Uganda. It is one of fewest public laboratory that offers fine-needle aspiration cytology services in the country. Patient's demographic information such as sex, age and FNAC results were extracted from the pathology register using a data abstraction sheet. FNAC results were categorised into 4 groups such as benign, suspicious for follicular neoplasm, suspicious for malignancy and malignant categories which are defined by the Bethesda system. The data collected was entered using Epidata software and exported to the Statistical Package for Social Sciences (SPSS) version 17.0 for analysis.

## Results

Out of 170 thyroid FNA cases reviewed at the MakCHS pathology laboratory, 158(92.8%) were females and 12(7.1%) were males. Thus the ratio of males to females was 1:13. The mean age at diagnosis was 45 year for males (ranges from 19–67 years) and 42 year for females (ranges from 9–90 years). These findings were summarized as shown in Table 1 & Table 2 respectively. Of the 170 cases of thyroid nodules detected among patients, majority of patients were at the age range of 40–49 years 40/170 (23.5%) followed by 30–39 years age group (21.3%). In this study, the thyroid lesions observed were classified as Benign (87.1%), Suspicious for follicular neoplasm (1.8%), Suspicious for malignancy (2.9%), and malignant (8.2%). The details are shown in Table 3 below. Generally benign lesions were the commonest accounting for (77.6%) of all cases followed by suspicious (9.4%) and only (8.2%) conditions were malignant. In the benign category cases of colloid nodule were the most commonly diagnosed accounting for 41.2% followed by follicular adenoma which accounted for 25.3%. In the suspicious category cases of suspicious for papillary carcinoma were the most commonly diagnosed accounting for 2.9% followed by suspicious for follicular neoplasm constituting 1.8%. Cases of papillary carcinomas were found to be the most diagnosed most diagnosed among the malignant categories accounting 7.6%. These findings were summarized in Table 4. Sex of the patient was found to be moderately associated with specific diagnosis as it showed a P value 0.034( $p < 0.05$ ) which was considered statistically significant. More females 158/170 were affected than males 12/170. Age was highly associated with specific diagnosis since it showed P value 0.01 ( $p < 0.05$ ) which was considered statistically significant. These findings were summarized as shown in Table 5.

**Table 1**  
**Social demographic distribution of study participants.**

<b>Sex</b>	<b>Age</b>							<b>Total</b>	<b>%</b>
	0-9	10-19	20-29	30-39	40-49	50-59	60-69		
Male	0	1	1	1	5	2	2	0	12
Female	1	10	25	35	35	28	15	9	158
Total	1	11	26	36	40	30	17	9	170
%	0.6	6.5	15.5	21.2	23.5	17.6	10	5.3	100

**Table 2**  
**Gender / age relation of study participants**

<b>Gender/Age</b>	<b>No.</b>	<b>Mean</b>	<b>Median</b>	<b>Mode</b>	<b>Range</b>	<b>Min.</b>	<b>Max.</b>
Female	158	42	41	30	81	9	90
Male	12	45	45	19	48	19	67

**Table 3**  
**Thyroid lesions diagnosed according to age groups.**

<b>Age groups</b>	<b>Classification</b>					<b>Total</b>
	<b>Benign n(%)</b>	<b>Suspicious for FN n(%)</b>	<b>Suspicious for malignancy n(%)</b>	<b>Malignant n(%)</b>	<b>N(%)</b>	
0-9	1(0.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.6)
10-19	10(5.9)	0(0.0)	0(0.0)	0(0.0)	1(0.6)	11(6.5)
20-29	21(12.4)	2(1.2)	2(1.2)	0(0.0)	1(0.6)	26(15.3)
30-39	33(19.4)	0(0.0)	1(0.6)	2(1.2)	2(1.2)	36(21.3)
40-49	35(20.6)	0(0.0)	2(1.2)	3(1.8)	3(1.8)	40(23.5)
50-59	26(15.3)	1(0.6)	0(0.0)	3(1.8)	3(1.8)	30(17.6)
60-69	16(9.4)	0(0.0)	0(0.0)	1(0.6)	1(0.6)	17(10.0)
70+	6(3.5)	0(0.0)	0(0.0)	3(1.8)	3(1.8)	9(5.3)
<b>Total</b>	<b>148(87.1)</b>	<b>3(1.8)</b>	<b>5(2.9)</b>	<b>14(8.2)</b>	<b>170(100.0)</b>	

Table 4  
Specific diagnosis of the study participants.

Classification	Sub-Type	Number	%
Benign	<i>Acute thyroiditis</i>	3	1.8
	<i>Lymphocytic thyroiditis</i>	10	5.9
	<i>Granulomatous thyroiditis</i>	3	1.8
	<i>Colloid nodule</i>	70	41.2
	<i>Adenomatous nodule</i>	10	5.9
	<i>Nodular goiter</i>	6	3.5
	<i>Follicular adenoma</i>	43	25.3
	<i>Hurtle cell adenoma</i>	1	0.6
Suspicious for follicular neoplasm	<i>Hurthle cell neoplasm</i>	3	1.8
Suspicious for malignancy	<i>Suspicious for papillary carcinoma</i>	5	2.9
Malignant	<i>Follicular carcinoma</i>	1	0.6
	<i>Hurthle cell carcinoma</i>	1	0.6
	<i>Anaplastic carcinoma</i>	1	0.6
	<i>papillary carcinoma</i>	13	7.6
Total		170	100

Table 5  
Chi-square test for association of social demographics with specific diagnosis.

Demographic	Value	df	P value
Age	144.6	2362	0.01
Sex	23.691	13	0.034

## Discussion

Thyroid nodules are common entities, frequently discovered in clinical practice, either during physical examination, but also incidentally, during various imaging procedures [4]. Fine needle aspiration (FNA) of thyroid is a cost-effective, simple, diagnostic tool in the initial screening of patients with thyroid lesions [5]. Its role is to classify the examined lesion as malignant, suspicious, or benign and, thus, to select the patients who would be treated surgically [6]. In this retrospective study, cases of thyroid lesions were predominant in females accounting for 158(92.8%) which was in concordance with studies done by

Melak *et al.*, [7] and Masereka *et al.*, [8]. This is possibly because of good health seeking behavior exhibited by females as compared to the males. Benign lesions were most commonly diagnosed with a percentage of 77.6% was congruent to the study done by Nassanga *et al.*, [9] and Sharma *et al.*, [10]. Colloidal nodule represented majority of benign cases which was similar to studies done by Sinna and Ezzat [11]. Papillary carcinoma was the most commonly reported lesion in the malignant category which is contrary to studies done by Shirish *et al.*, [12] which reported follicular carcinoma as the most predominant lesion. This is probably because the present study comprised of a smaller sample size ( $n = 170$ ) in comparison to the latter study ( $n = 606$ ). Significant association was observed between sexes ( $P = 0.035$ ) with the female sex being the most affected. An association between age and thyroid lesions was also observed ( $P = 0.01$ ) with the malignancy being observed in older patients as compared to young adults and mean age at diagnosis of malignancy was 61 years which is similar to the findings of Melak *et al.* [7]. This is probably attributed to the natural history of thyroid malignancy, genetic factors and environmental factors.

## Conclusion

The present findings are consistent with those published in other literature with benign lesions showing predominance. However, the occurrence of malignancy was found to be lower than published though still remains significant. Sex and age were found to be associated with diagnosis with the females being most affected gender as well as those in the older group.

## Recommendation

More research done in future with detailed socio demographic information and findings is crucial to determine the utmost classification and clinical feature for thyroid lesions which will aid in raising the index of suspicion among clinician. Also use of bio markers in proper diagnosis of thyroid lesion is necessary as it will aid proper classification of the lesions.

## Abbreviations

FNAC, Fine Needle Aspiration Cytology; FN, Follicular Neoplasm; MakCHS, Makerere University College of Health Sciences; SPSS, Statistical Package for Social Sciences.

## Declarations

**Consent to participate:** The permission to carry out this study and disseminate its findings was obtained from the head of department pathology of Makerere University College of Health Sciences and the institutional review board (IRB) of School of Biomedical Sciences. Informed consent was waived by the IRB.

**Ethical consideration:** All methods were carried out in accordance with relevant guidelines and regulations.

**Consent for publication:** Not applicable

**Availability of data and materials:** The Data is available in hard copies. The datasheets used and/or analyzed during the current study available from the corresponding author on reasonable request.

**Competing interest:** Authors declare no conflict of interest

**Funding:** There was no source of funding for this study **Authors' contribution:** G.E.D designed the study, participated in data collected data, managed and analyzed it. R.L, P.B & D.B.A was responsible for data analysis, manuscript development, and reading of manuscript. M.B was responsible for drafting the manuscript. All authors have read and approved the final manuscript.

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