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The Prevalence of Socio-Demographic Factors of Fine Needle Aspiration Cytology (FNAC) For Diagnosis of Thyroid Nodule

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Abstract **Original Research Article**

Background: FNAC is a minimally invasive, fast method with great patient compliance for diagnosing thyroid nodules. However, its diagnosis is still up for debate. Evaluation of the sensitivity and specificity of thyroid nodule diagnosis using histology and fine needle aspiration cytology (FNAC). ***Objective:*** To determine the frequency of socio-demographic parameters in thyroid nodule detection using fine needle aspiration cytology (FNAC). ***Materials and Methods:*** From July 2017 to December 2017, the current study was conducted to examine the cytological characteristics of thyroid nodules among OPD and hospitalized patients of the ENT department at Dhaka Medical College. A cross-sectional investigation was conducted. Following that, the final sample size of 73 was determined based on the eligibility requirements. A peer-reviewed, pre-structured data collection sheet for interviews was created. The collected data were managed, reduced, and plotted into tabular and figure formats. ***Results:*** Out of 73 patients maximum 21(28.76%) patients were from 30-39 rears age group. among 73 patients 49(67.13%) were female and 24(32.87%) were male. The male to female ratio was 1: 2.04. Among 73 patients, 75.34% were from middle class followed by 20.54% were from poor class and 29 (39.72%) were housewife, 26 (35.61%) were service holder and 14 (19.17%) were students. among 73 patients, 39(53.42%) patients resided in urban area and rest 34(46.57%) resided in rural area. ***Conclusion:*** According to this study, FNAC should be the go-to diagnostic method for all thyroid nodule patients. Longer-term studies with a high number of study participants may be done for results that are more accurate.

Keywords: Thyroid nodule, FNAC, ENT, Socio demographic factors.

INTRODUCTION

A thyroid nodule is any abnormal growth that develops into a mass in the thyroid; it is more common in older women, those who lack iodine, those who have been exposed to radiation, and those who have a family history of thyroid disease [2]. Diets rich in goitrogenic chemicals can enhance the risk of thyroid nodule development. Thyroid nodules affect 4% to 7% of adult population [3]. But just 5% of adult thyroid nodules are malignant [5]. The highest incidence of thyroid nodules in Bangladesh, which ranges from 21 to 30%, is found in the Jamalpur Rangpur area [6]. Compared to nodular thyroid disease, diffuse goiter is less common. A study from the thyroid clinic at BSMMU in Dhaka found that 32.67% of all thyroid patients had solitary nodules [6]. The typical symptoms of thyroid disease include swelling, pressure feelings, or toxicological signs [7]. When cancer has spread to nearby organs such the trachea, larynx, oesophagus, and recurrent laryngeal nerve, symptoms such as pain in the inferior and anterior neck region, cough or dyspnea, dysphasia, or odynophagia are apparent [8]. The majority of adult thyroid tumors are benign, however less than 5% of them are [9]. Nevertheless, a number of clinical signs and symptoms could shed some light on the cause of the thyroid nodule. Thyroid cancer is more common in those who have had radiation therapy to the head and neck region, and thyroid nodules that absorb radioactive iodine during imaging tests (called hot nodules) are more likely to be cancerous than those that do not. Compared to many nodules, solitary nodules are typically more likely to be malignant. Additionally,

nodules in younger people have a higher chance of being malignant than those in older ones. These nodules are typically benign nodules or non-malignant lesions. It is recommended to only operate on those patients in whom a suspicion of malignancy exists, in order to avoid unnecessary surgery, hypoparathyroidism, and thyroid hormone dependency in those with benign thyroid nodules. However, it is impossible to tell the difference between these benign lesions and a malignant nodule only by looking at them clinically [10-12]. Currently available techniques to identify the type of thyroid nodule include thyroid function tests, thyroid antibody titers, isotope scans, ultrasonography, and FNAC [13]. Even though it only accounts for a minor amount of the overall assessment, FNAC is an essential part of managing some patients [14]. Both the radio-nucleotide scan and the ultrasound examination were used to evaluate the thyroid nodule, however none produced a conclusive cancer diagnosis. After the FNAC test with these specific needles was completed, the procedure was finally deemed acceptable [15]. Since it can identify the lesion's kind before surgery, FNAC is recognized as the "gold standard" diagnostic technique for examining thyroid nodules [16, 17]. SAFE, which stands for Simple, Accurate, Fast, Economic, and Indeed Safe, encapsulates the extra advantages of FNAC provided on an outpatient basis. With this approach, a histological diagnosis has the best safety record. In contrast, a surgical biopsy may be riskier due to the need for anesthesia, surgery, and a longer recovery period [18]. The limitations of this strategy are quite few. It can be difficult to identify various thyroid pathologies with FNAC. The main reasons for the interpretation problems are the small amount of cellular material that is available for study and the loss via aspiration [19]. As a result, when assessing patients with thyroid nodules, FNAC is now frequently employed as the primary investigation. With the exception of surgical resection, it has the ability to provide vital information that can be discovered by other research. Ultrasonography and isotope scanning are no longer necessary due to the accessibility of FNAC. Financial savings are significant. Patients with thyroid nodules are assessed before to surgery with a less invasive procedure called FNAC. In addition to providing excellent diagnostic precision when evaluating other thyroid disorders, FNAC also provides excellent sensitivity for identifying thyroid cancer. The purpose of this study was to find out the socio demographic characteristics of FNAC for the diagnosis of thyroid nodule so that the variables can helpful to find the prevalence in FNAC diagnosis.

OBJECTIVE

To find out the prevalence of socio demographic factors in fine needle aspiration cytology (FNAC) for the diagnosis of thyroid nodule.

MATERIALS AND METHODS

Study design: It was a cross-sectional study

Place of the study: Department of ENT and Head-Neck Surgery, Dhaka Medical College Hospital, Dhaka.

Duration of the Study: July 2017 to December 2017

Sample size: The total sample size used in this study was 73.

Sampling Technique: Random sampling is the methodology used for sampling. After obtaining written consent, all consecutive cases with thyroid nodules admitted to the Department of ENT and Head-Neck Surgery at the Dhaka Medical College Hospital during the six-month study period were included. In a standardized questionnaire, patient information (name, age, and sex), medical records, and clinical examination findings were documented.

Study population: Individual or referred patients who were admitted to the ENT and head-neck surgery department through the OPD. DMCH with the complaints of thyroid nodule.

Inclusion Criteria: Clinically diagnosed thyroid nodule, Both Male and Female of any age group.

Exclusion Criteria: Patients who refuse to be included in this study.

Content of questionnaire: Pre-tested structured questionnaires were created by looking over earlier research on the topic.

Study variables: Age, Sex, Thyroid gland histopathology findings, serum T3, T4, and TSH levels, thyroid nodule USG-guided FNAC, and thyroid gland sonographic findings.

Ethical issues: Concerning ethical matters, the institutional Review Board and the relevant DMCH authority gave their approval for the study. The concerned department, where we gathered our study volunteers, gave its approval for the study. All of the study participants were fully-informed about the nature, goals, and implications of the study as well as its full range of advantages and disadvantages. To protect their rights and health, the subjects' interests were not jeopardized. All study participants were guaranteed appropriate care for any complications that arose in connection with the study's objectives. The subjects received assurances regarding their privacy and their right to withdraw from the study at any time. All study subjects' written consents were obtained voluntarily and without using coercion or preying on any vulnerability.

Study procedure: According on the provided history, a pre-tested questionnaire was filled out. clinical

assessment of the patient, routine examinations, thyroid profile the neck's ultrasound Pathology department of Dhaka Medical College doing fine needle aspiration cytology with hypodermic needles of 21–24 gauge, To rule out symptomatic vocal cord paralysis and for medical and legal reasons, an indirect laryngoscopy will be performed. Surgery and specimen collection took place at the Dhaka Medical College Hospital's Department of ENT and Head-Neck Surgery. According to the diagnostic, to assess accuracy, age sex distribution, and symptomatology, at the Department of Pathology, Dhaka Medical College, Dhaka, and FNAC was compared with resected specimen histology.

Data presentation: After data collection, they were sorted and displayed in tablets, graphs, and figures in an understandable manner.

Data Analysis: SPSS 22 for Windows was used to analyze the data.

RESULTS

Table 1 showed that out of 73 patients 28.76 % patients were from 30-39 years age group whereas 23.28 % were from 20-29 years age group. 19 - 65 years with a mean of 35.36 ± 11.86.

Table 1: Distribution of patients according to age

Age group (in years)	Frequency (%)
< 20	12 (16.43 %)
20-29	17 (23.28 %)
30-39	21 (28.76 %)
40-49	14 (19.17 %)
50-59	5 (6.84 %)
≥ 60	4 (5.47%)
Mean age (in year)	35.36 ± 11.86
Age range (in years)	19-65

Figure 1 showed that out of 73 patients 49(67.12%) were female and rest 24(32.87%) were male. The male to female ratio was 1:2.04.

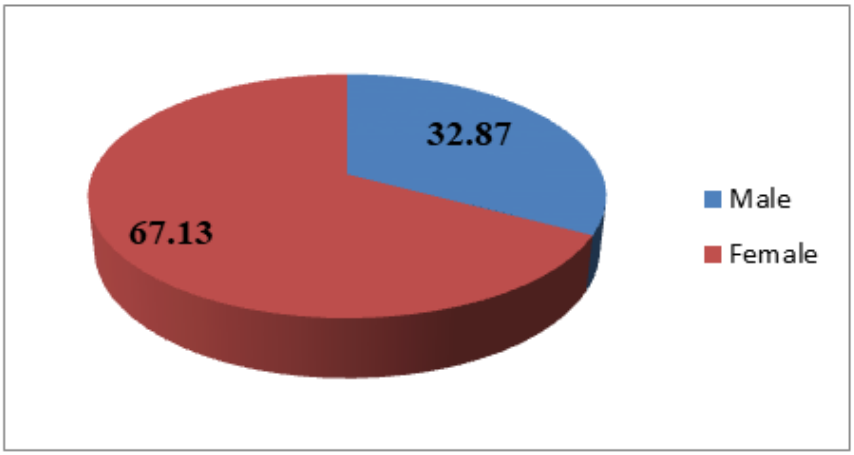

Figure 1: Distribution of patients according to sex

Table 2 showed that Most of the male is doing various services whereas most of the female were housewife. Female student (Nine) were more in number than male (five) student.

Table 2: Distribution of occupation according to sex

Occupation	Male (n=31	Female (n=70)	Frequency (%)
Students	5 (6.85%)	09 (12.32 %)	14 (19.17%)
Service Holder	15 (20.55%)	11 (15.06 %)	26 (35.61%)
Businessman	4 (5.47%)	0 (0 %)	4 (5.47%)
Housewife	0 (0%)	29 (39.72 %)	29 (39.72%)
Total	24 (32.87%)	49 (67.12 %)	73 (100%)

Figure 3 showed that out of 73 patients, 39 (53.42%) patients were from urban area and 34 (46.57%) patients were from rural area.

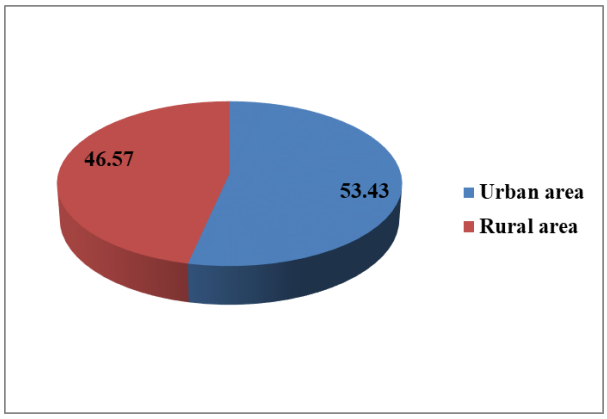

Figure 2: Distribution of patients according to area of residence

Table 3 showed the overall cytology of the sample population. Nearly half (43.83%) of the patient had Multi-nodular goiter, Followed by colloid goiter (16.43%). Only 18 patients (24.66%) were diagnosed as carcinoma.

Table 3: Distribution of patients according to FNAC diagnosis

FNAC diagnosis (n=73)	Frequency (%)
Multinodular goiter	32 (43.83%)
Colloid goiter	12 (16.43)
Colloid cyst	2 (2.74%)
Hashimoto's thyroiditis	
With MNG	2 (2.74%)
Without MNG2	2 (2.74%)
Follicular adenoma	5 (6.85%)
Follicular variant of papillary carcinoma	7 (9.59%)
Papillary Carcinoma	11 (15.07%)

DISCUSSION

Thyroid nodules, which are common entities, must be evaluated by a thyroid surgeon. Nodules may be discovered through physical examination or imaging methods accidently employed for other purposes. The majority of thyroid nodules are benign, but they should be surgically removed if they are large enough to cause symptoms or if a malignancy is detected. Most research on the thyroid gland involves ultrasonography technology. Fine needle aspiration cytology is the primary line of diagnosis for thyroid swellings [21]. The method helps in preoperative patient selection for surgery because it is quick, simple, safe, and has a low rate of complications. Thyroid cancer is the most common endocrine system malignancy, accounting for 0.6% and 1.6%, respectively, of all cases of malignant neoplasm in men and women. The age range of the patients in the current study was 19 to 65, with a mean of 35.36 11.86. This age range and mean incidence are somewhat lower as compared to earlier studies [22]. We found that the majority of patients in our study (48%) were in their third to fourth decade of life, which contrasts with the research of Dorairajan and Jayashree, where only 44% of the patients were in this decade. 49 (67.13%) of the 73 patients in this study were female, whereas 24 (32.87%) were male. Male to female ratio was 1:2.04. 60% of the patients in a different study by Md. Shafiqul Islam6 were between the ages of 21 and 40. Average age of 37.70 (SD 10.05). The age limit was set at 60 and the minimum age was 18. 26 men (28.88%) and 64 women (71.12) were present. 1:2.46.6 Males represented by females As a result, our findings were validated by those of the preceding investigations. In a comparable study carried out in Bihar, 178 thyroid enlargement patients underwent FNAC, and colloid goitre and thyroiditis were found in 75.84% and 8.43% of cases, respectively [23]. In contrast, our research found multi-nodular and colloid goiter in 60.265 and 5.5% of the population, respectively, which is about the same as their finding. Only 128 out of 1488 individuals, or 7.8% of the total, had cancer detected according to a second FNAC evaluation of thyroid goiter over five years. Our analysis found a far higher amount of malignancy 24.66% than what they did. The cause of this wide range of sensitivity and specificity is complex. It depends on the caliber of the samples, the sampling technique, how well the pathologist reads the smears, and whether any benign and malignant thyroid lesions share cytological traits. The total FNAC accuracy rate for thyroid cancer detection ranges from 90% to 100% [23]. In contrast to other research, where the accuracy of FNAC varied from 79% to 98% depending on the skill of the FNAC performer and the cytologist analyzing the

results of the cytology, the accuracy of FNAC in our study was 99% [24].

CONCLUSION

According to the study, this minimally invasive method exhibited 100% specificity, the best level possible. The study's main premise was that the most effective preoperative diagnostic technique for thyroid nodule diagnosis is FNAC. The sensitivity of FNAC was determined to be 94.73% in this investigation. Therefore, we may say that the diagnosis is usually correct. We can infer from the information above that the most effective preoperative diagnostic technique for thyroid nodule diagnosis is the FNAC. This study has some limitations, including a small sample size, a brief study period, and intentional sampling. This study suggested that using FNAC as a standard diagnostic technique for all thyroid nodule patients. For more accurate results, longer-term research with a large number of study participants may be conducted.

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