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Research Article

**A CROSS-SECTIONAL RESEARCH ON THYROID
INCIDENTALOMAS (TI) OCCURRENCE AND ITS
ASSOCIATION WITH GENDER, AGE AND ETHNIC
DISTRIBUTION**

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Abstract:

Objectives: The main objective of our research was to describe the occurrence related to thyroid incidentalomas (TI) and its link with gender, age, people and societies through ultrasound (US).

Methods: This cross-sectional research was carried out Allied Hospital, Faisalabad (September 2016 to August 2017). Total 270 grownups having no symptoms of thyroid disease of the age above 21 years, underwent thyroid ultrasound inspection.

Results:

The "TI" frequency was found 21%, detected in males 15% and in females 26% ($P = 0.077$). Thyroid nodules (TN) found 60% in one portion (left, right, isthmus) and 40% TNs were in many places. Single TN found in, about 56% and multiple TNs in 45%. It was observed that 37% had TNs greater than 1 cm; whereas, 58% were having TNs shorter than 1.0 cm. Seven percent were having TNs larger and lesser than 1.0 cm. It was also observed, in different ethnicities, participants were having equally common TI. ($P = 0.76$).

Conclusion:

The thyroid incidentalomas frequency was greater as compared to many other iodine-rich states. In both genders of our study, Incidentalomas were equally common. The same will be presented in many other studies if Pakistan holds the status of an iodine-rich state.

Keywords: Ultrasonography (USG, US), Thyroid Nodule (TN), Thyroid Gland (TG), Thyroid Hormones (TH), Thyroid Neoplasms, Thyroid Function Tests and Thyroid Incidentalomas (TI).

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INTRODUCTION:

The occurrence of discovery related to subclinical endocrinal organ nodes, specifically in thyroid gland which is also known as “TI” has been enlarged by the progression in the field of medical technology. The discovery of a thyroid nodule (TN) is expressed through (TI) by imaging research in persons who are not having any symptoms for thyroid disease [1, 2]. The different growth of follicular cells of the thyroid, that causes gland’s swelling is called TN. A thyroid swelling present near the surface of a gland is palpable.

It is called functioning when the TN carries out thyroid hormones secretion and in the absence of secretion process it is non-functional. TN can be multiple, on its own, hard or cystic and can be benevolent or malignant [3, 4]. With normal thyroid function tests TNs are generally asymptomatic. Many elements have been recognized; Along with these adenomas, thyroiditis, and cysts, the risk for increased TI frequency are mainly Hashimoto’s thyroiditis [3, 4]. “IT” is revealed through many studies that, frequency gets an increase with growing age and this factor is more common in females. These nodes are prominent widespread goiter areas like Sudan, and Ghana and in height contact with areas affected by radiation [4, 5 – 9]. TI Frequency is largely affected through detection technique. According to a research study 6.5% size of TN, smaller than 0.6 cm could be noticed by palpation [10]. General detected TN frequency by the palpation is (2% – 20%). But, ultrasound TN detection may be of only two millimeters in the range if (20% – 87%) that can be compared with “TI” detection at postmortem inspection (31% to 61%) [1, 5 – 8, 10]. During thyroid gland palpation, the small node can be missed. And the method not dependable in defining the kind of nodes well (cystic, solid, or mixed) and in recognizing nodes in event of numerous nodes [6, 10]. The US is noninvasive, economical, precise and safe techniques through which small TNs can be deducted that have been wasted by palpatory technique. The technique could also spot form, size, and some malignant features of nodes. Additionally, it can find local lymphadenopathy in a state of distortion and due to its seen surveillance. A “TN” discovered during the examination can be malevolent as that of a palpable TN [10 – 13]. Features the malevolent TNs ultrasound are totally hypoechoic solid masses with enlarged blood movement in the midpoint [10 – 14]. TN is called a hot node when yields extra thyroid hormone. This brings to hyperthyroidism and thyrotoxicosis detected by the function test of thyroid [3]. Furthermore, node turning malignant can appear. It requires well in time

detection and management of TN. It is already seen in many studies that 0.46% to 14% of thyroid incidentalomas can be distorted [6]. Here frequency spreads up to 34% spotted by PET-scan benevolent TNs are common in Pakistan as like other parts of the world when matched to malignant TNs [3]. Benign TNs frequency is reported as 90% in Pakistan. Adenomatous goiter Among the benevolent lesion, is the most predominant getting the 69% repetition, thyroid malignancy frequency range (11% – 14.40%) [15, 16]. Zuberi is of the view that thyroid cancer in Pakistan has more common is an age of 30 to 60 year of age [16]. The ratio of Female to male thyroid cancer as stated 2.2:1 in Pakistan [16]. Follicular, papillary and anaplastic carcinomas are main sorts of thyroid cancers. Frequency of Papillary carcinomas is 74.8%, follicular 21% and anaplastic carcinomas 6.8% [15].

The focus was to find, “TI” frequency bu ultrasound in grownups presented for examination in the hospital other than thyroid disease and to define its links with gender, age, and society as well.

METHODS:

This cross-sectional research was carried out Allied Hospital, Faisalabad (September 2016 to August 2017). Total 270 willing participants of the age above 21 years participated in the research study. After the thyroid palpation, participants have gone through US inspection at the Radiology Department. The sample was measured through the formula: $(n = Z^2 \times P(1 - P) / d^2)$. Here the n= number of persons P = 13.7% (TI incidence in the population) 17, Z = average of normal error = 1.97, d = absolute precision 6% = 0.06. Surgically operated, palpable “TN” cases and thyroid illness history cases were not included in the research. Persons with palpable (TN) were also omitted. Participants were told about the study and biodata forms were given to them as well to obtain the necessary basic information.

Anteroposterior, as isthmus thickness and craniocaudal, were considered as well Medio-lateral inspection of both parts of the thyroid was also carried out. An approval was taken from the ethical committee of the hospital. Statistical analysis was carried out [17].

To define the relationship of (TN) with gender, age, and society, a method of Chi-square was used and for comparing the average of age with node and without node T-test of Independent Student was used. P – Value considered significant 0.05 or lower.

RESULTS:

Outside 270 participants, females were 140 (52%) and male were 130 (48%). A significant difference was observed in an average age of the participants with nodes (49 ± 14.8) years and without nodes (40.24 ± 14.8) years, (P-value = 0.00). "TI" occurrence rate was 22% (57 / 270). TI was irrelevantly common in females 26% (36 out of 140) as compared to males 16% (22 / 130) (P= 0.077)

(Table – I). The occurrence rate of TNs enlarged with the age and there stayed an important alteration in TI along with the dissimilar groups of age (P = 0.003) (Table – I). But, TI incidence was common along with the participants from all societies (P = 0.759) (Table – I). About 56% (32 / 56) participants in the research study were having the single node and 46% (26 / 56) had numerous nodules.

Table – I: Gender Distribution

Gender	Nodule Positive		Nodule Negative		P-Value
	Number	Percentage	Number	Percentage	
Male	21	16.3	108	83.7	0.078
Female	35	25	105	75	

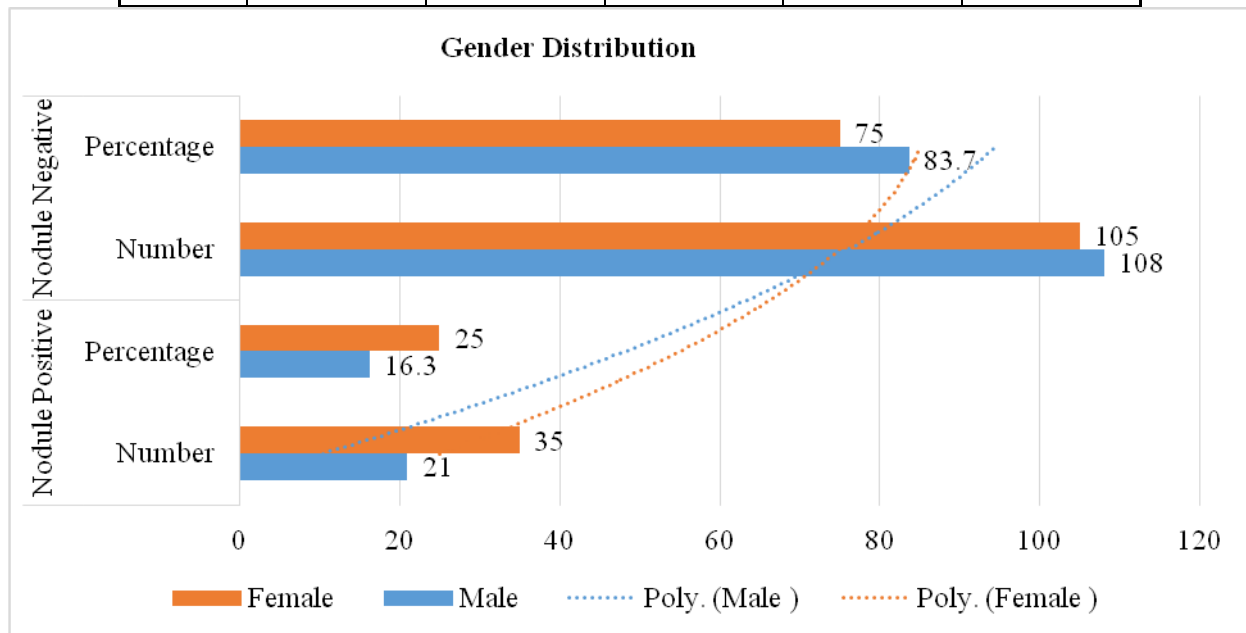


Table – II represents the percentage related to the single node and numerous nodes. Roundabout 40% (23 / 56) individuals were having TNs in more than one position. About 39% (22 / 56) participants were having TNs only in right part, 22% (13 / 56) participants were having TNs merely in left portion and 2% (1 / 56) participants were having TNs in isthmus only. About 39% (22 / 56) participants in the research study were having TNs larger as compared to 1 cm and 58% (32 / 56) participants had TNs lesser as compared to 1 cm. 6% of individuals (3 / 56) were having TNs larger and lighter than 1 cm.

Table – II: Age Wise Distribution

Age	Nodule Positive		Nodule Negative		P-Value
	Number	Percentage	Number	Percentage	
20-30	4	5.9	64	94.1	0.002
31-40	15	20	60	80	
41-50	12	27.3	32	72.7	
51-60	12	25.5	35	74.5	
60 Above	13	37.1	22	62.9	

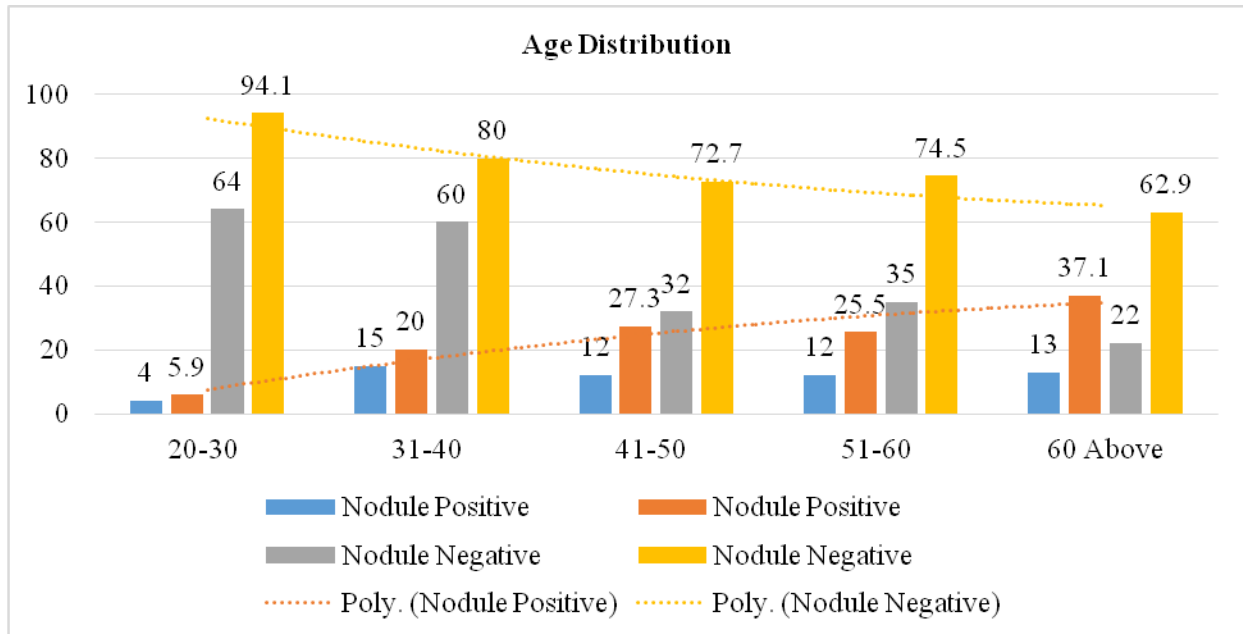
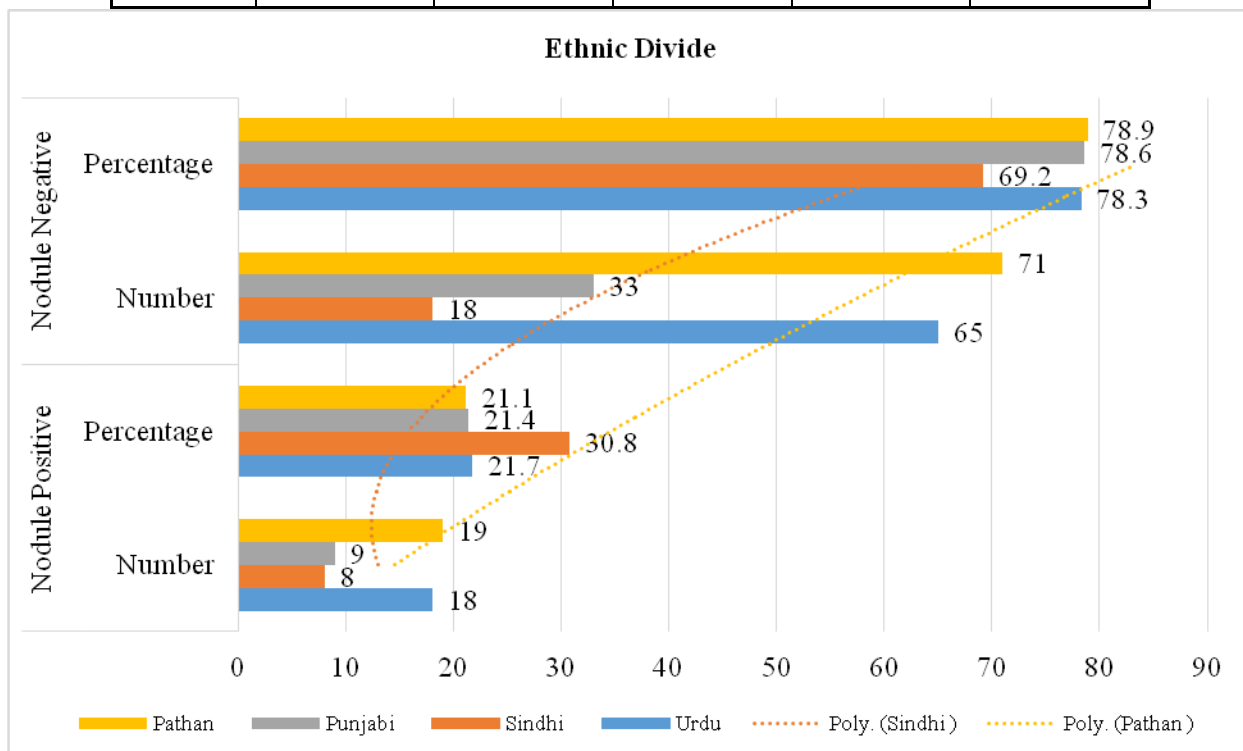


Table – III: Ethnic Distribution

Ethnicity	Nodule Positive		Nodule Negative		P-Value
	Number	Percentage	Number	Percentage	
Urdu	18	21.7	65	78.3	0.758
Sindhi	8	30.8	18	69.2	
Punjabi	9	21.4	33	78.6	
Pathan	19	21.1	71	78.9	



DISCUSSION:

Most usual technique for finding the TNs is examining thyroid through palpation but it ignores acutely situated nodules. Technology has provided a rise in the finding of the TNs. Ultrasound (thyroid) is more accurate and economical. The physical appearance of node similar to echogenicity (hyperechoic, hypoechoic) arrangement (cystic, mixed and solid), existence or deficiency related to calcification, margins (irregular or regular) and flow of blood (enlarged or reduced) can be recognized by ultrasonography [10 – 13]. A study in 1998 proposed that a high-resolution examination the US provides large sensitivity and good speed of scanning [10]. TI frequency varies in diverse areas of the world. Many elements have been described for these disparities including gender, age, and intake of iodine [5, 7, 8] “TI” frequency (13.6%) in Iran, USA (10%), California (14%), Korea (36.67%), Poland (14.8%) and Finland (27.36%) [7, 17 – 21]. In our research Frequency of TI was found somewhat larger than many iodine-rich places and reason can be the recent development of iodine-rich state of Pakistan [9].

The average participant’s age with “TI” was and without “TN” was observed respectively (49 ± 14.8) and (40.25 ± 14.8) years; in this research average age of individual without node and with node was (64.3 ± 14) years and (62.7 ± 16) years in turn [22]. With the age Frequency of TI increases [7, 10, 12 – 14, 17, 18] (Table – I). But, TI occurrence rate after 60 years (38%) was smaller as compared with that of American Association of Thyroid (50%) [4].

TI frequency is greater in females as indicated by many studies. [7, 8, 13, 17, 21, 22]. Barbara *et al.* in the year 1982 stated male 8% and female 21% in the USA were not having symptoms TNs [19]. TNs frequency was found difficult in females in our study (26%) as in comparison to males (17%) on the other hand these results were unimportant statistically ($P=0.078$). In Pakistan shortage of iodine in current past can be considered basic reason for enhanced TI frequency in both male and female [23]. Taheri *et al.* in the year 2008 stated, 52% of the population of Iran was having TN in a portion (left, right or isthmus) and 49% of participants were having TN at many places [22]. But, Steel *et al* stated 50% participants with two-sided TNs and 51% participants, independent TNs outcome of our research were alike both researches, however, independent nodes (61%) were more prevalent as compared to bilateral nodules (40%) [18].

TN classification as single and multiple nodules is very important, in the year 2011 a study stated,

Pakistan is in danger of thyroid distortion in the case of multiple nodes [16]. An alteration in rate of single and multiple nodes was reported respectively as (56%) and (46%) in our research which is very much less than the outcomes as reported by Taheri, who stated that more usual was single node in Irani population (62%) as participants were having single node and 40% were having multiple nodes [22]. The occurrence of single and multiple nodes in the residents of Finland, 58% and 23% in turn [7]. Distortion rate in TN is equivalent in node larger and smaller as compared to a size of one centimetre and thyroid the ultrasound for the nodular disease of thyroid sicknesses deals great sensitivity [10, 14]. The frequency of node under 1 cm was reported as (58%); whereas, node above 1 cm was reported as (40%) and only five percent participants were reported under or above one centimetre. These observations were near the findings as stated by Mohammadi *et al.* Where 62% participants were having node shorter than 1cm, 34% participants had node greater than 1 cm and 6.4% participants were having nodes larger and smaller than 1.0 cm [17] but in a research study it was stated 70% frequency related to node shorter than 1 cm [7]. In our research study, TN was reported common in numerous societies (Table – I). There are two possible reasons behind this fact; at first, Muslims have the religious obligation for consumption of seafood [24]. In addition, there is an easy contact to seafood due to seaside location. TI frequency was only determined in our residents. Due to our study limitations, we failed to determine the rate of occurrence because the research was limited in its scale and the use of 3-d US was more precise than 2-d US [25, 26]. Even though the research study displayed the TN in communal in all the societies but we were unable to generalize results because the sample size was short.

CONCLUSION:

“TI” frequency was reported high in our research as compared to many other iodine-rich states. Incidentalomas was found equally common in our study in both Genders. The reason could be due to former iodine widespread lacking position of Pakistan. But, research studies in this prospect will assist us in a finding of the right condition of Thyroid incidentalomas if iodine rich status is retained by Pakistan.

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