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### RESEARCH ARTICLE

#### Pattern of Thyroid Disease in Hail Region, Saudi Arabia.

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#### Abstract

**Background:-** Thyroid gland is one of the important organ in human body and the burden of thyroid diseases in the general population is enormous specially in females. In Saudi Arabia its pattern is differ from area to area

**Aim of the study:-** The present work was conducted to study the pattern of thyroid disorders among patients attended to the endocrinology clinics in King Khalid Hospital , Hail region , Saudi Arabia.

**Results:-** The patients complaining of different thyroid disorders were 175 . 98(56 %) cases was found to have hypothyroidism and 57 ( 32.6 %) had hyperthyroidism . Iodine deficiency was associated with hypothyroidism in females but it was common in males with hyperthyroidism The etiology and risk factors of hypothyroidism were stress, malignant tumors, Hashimooto thyroiditis and diabetes in males while they were bad nutrition, Iodine deficiency, goiter, benign thyroid tumor and family history in females . Diabetes , graves disease , benign and malignant tumors were common in males but bad nutrition , iodine deficiency , goiter and family history were the more frequent in fameless suffered from hyperthyroidism .Total cases with goiter were 89 most of them were males (60.7%) palpable goiter was more common 75.5 than visible type . Malignant thyroid were found mainly in males (75%) with papillary type of cancer (64.3% ) and the common presenting manifestation was hyperthyroidism (53.6%).

**Conclusion:-** Thyroid disorders are common in Hail region specially in females .The pattern is more or less similar to that detected in other Saudi cities .Goiter and malignant thyroid are more common in males.

**Recommendation:-** More studies should be carried out in Hail region to stress on the individual thyroid disorder so as more comprehensive studies could be obtained.

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#### Introduction:-

Thyroid gland is one of the important organ in human body and the burden of thyroid diseases in the general population is enormous specially in females . Thyroid disorders create many problems although most undergo

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medical or surgical management. Thyroid diseases are generally grouped and manifested into two main categories which are either due to reduced activity of the gland (hypothyroidism) or due to over activity (hyperthyroidism). The former are more common in older people (**La Franchi,1994 & Griffith et al 1999**).

The epidemiology of thyroid diseases in iodine- sufficient areas deals mainly with sporadic goiter and thyroid autoimmune diseases (**Elahi et al 2005** ). However in iodine deficient areas , other kind of goiters and thyroid cancers are more prevalent . The incidence of Multinodular goiter differs according to the countries and seems to be widely dependant on the iodine status( **Abu-Eshy et al 1994**)

The forms of thyroid disorders include nontoxic goiter, Graves 'disease, Hashimoto's thyroiditis and thyroid neoplasm (**Rallison et al.1991**). There are two main important autoimmune thyroid disorders which are Hashimoto thyroiditis and Graves disease. The former is the most common cause of hypothyroidism, whereas the latter is a major cause of hyperthyroidism (**Rossi et al., 1985**). There is a well known geographical dependency in thyroid diseases because of the different amounts of alimentary iodine intake that occur in different geographic locations (**Knudsen et al., 2000**). The number of people in the community who have microscopic nodules, palpable goiter , and occult papillary carcinoma has to be considered .

Risk factors of thyroid disease include: Gender ( thyroid disorders are higher in women than in men), Diet rich in goitrogens or deficient in iodine , Pregnancy , Radiation to the neck , Family history and Smoking (**Abdul Rahman et al 1997** )

The incidence and pattern of thyroid diseases were studied in Saudi Arabia by some investigators (**Al-Tameem, 1987; Koriesh et al., 1988; Abu-Eshy et al., 1994; Al-Zahrani et al., 2005**). However little is known about thyroid disorder studies in Hail area , so the present study was undertaken study the pattern and problem of disorders among patients attended the outpatient clinic of endocrinology , Hail area, Saudi Arabia.

### **Patients and methods:-**

This is retrospective study included 175 patients with thyroid diseases attended the endocrine outpatient clinic of King Khalid hospital, Saudi Arabia during the year 2013 . They were clinically diagnosed as having thyroid disorders . They were represented either by manifestation of hypothyroidism , hyperthyroidism or enlargement of thyroid gland . The data were collected from the medical admission and outpatients records. The data included sociodemographic data , clinical presentation , causes and risk factors .Results were tabulated and analyzed

### **Results:-**

The total number of patients attended the endocrinology clinic in King Khalid hospital was 819. The patients complaining of different thyroid disorders were 175 (21.4%) . Table (1) represented the age distribution of the subjects according to thyroid dysfunction . The mean ages of the patients was 42 years. The results of the current work demonstrated that out of 175 patients , 98 cases ( 27 male and 71 female ) was found to have hypothyroidism and 57 (26 male and 31 female) have hyperthyroidism ( Table 2).

Stress ( 59.4% ) , malignant tumors ( 75% ) , Hashimooto thyroiditis (75.6% ) , and DM (70.6%) as risk factors of hypothyroidism were more prevalent in males than females . While bad nutrition (89.8%) , Iodine deficiency (87.2) , goiter (51.6%) , benign thyroid tumor (84.4) and family history (80.8%) were more prevalent in females with hypothyroidism .

Iodine deficiency was associated with hypothyroidism in females but it was common in males with hyperthyroidism .

Concerning hyperthyroidism , stress , DM , graves disease , benign and malignant tumors were the common risk factors in males . Moreover , bad nutrition , iodine deficiency , goiter and family history were the more frequent in females.

Table (5)revealed that palpable goiter was more common 75.5than visible type and it was more prevalent in males (60.7%) (table 6) . Total cases with goiter was ( 89)

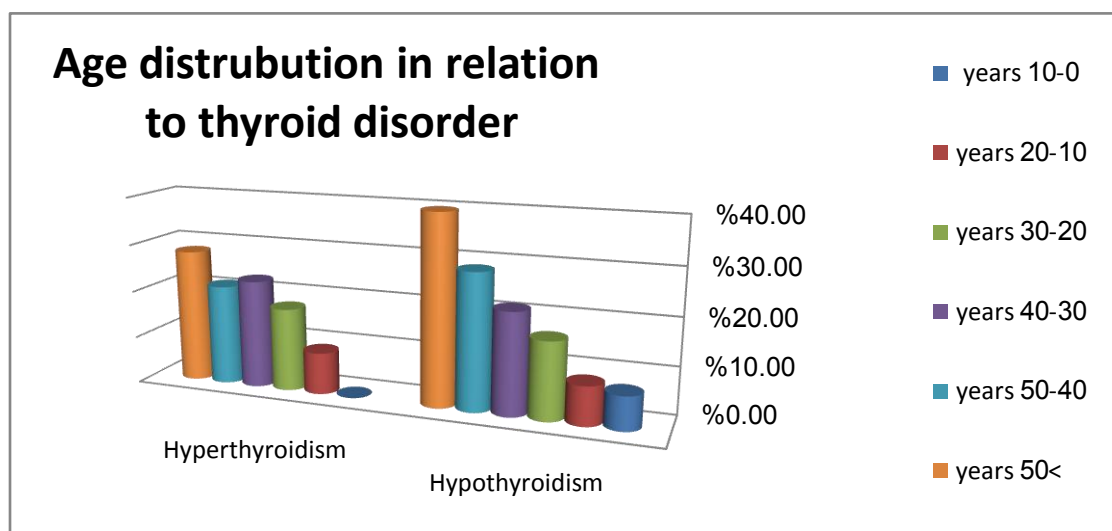
Subjects with thyroid swelling (goiter = 89 cases ) in the current study were represented either by diffuse type ( 41 cases) or solitary nodular type ( 38 cases ) . The histopathological studies obtained from the patients files revealed that 30 cases out of the 38 case with solitary nodules were benign

As regarding thyroid cancer , patients with thyroid cancer in the current study were mainly males (75%) with papillary type of cancer (64.3% ) and the common presenting manifestation was hyperthyroidism (53.6%).(tables 7,8,9 )

The most common manifestation in Patients complaining of hypothyroidism in the present work was obesity (65.3%). Whereas it was palpitation in case of hyperthyroidism (87.7%) Table (10,11)

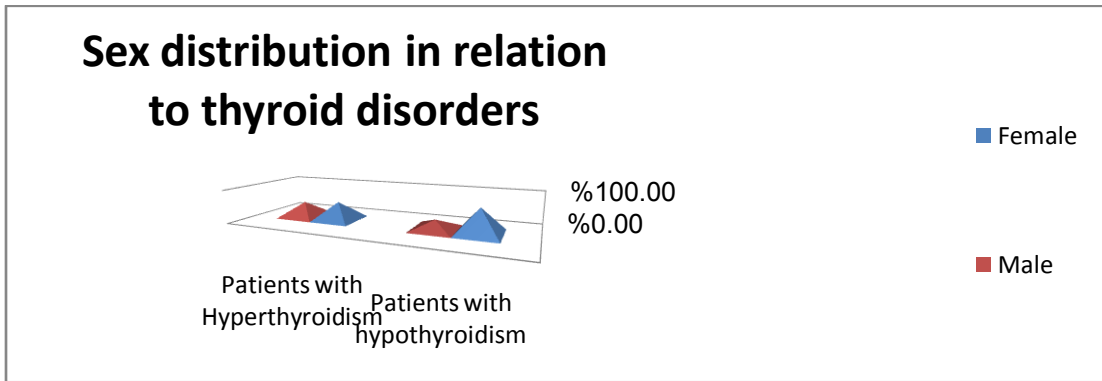
**Table 1:-** Age distribution in relation to thyroid dysfunction among patients with thyroid disorders in King Khalid Hospital , Hail region , Saudi Arabia during the year of 2013.

Age categories	Hypothyroidism		Hyperthyroidism		Total cases
	number	%	number	%	
0-10 years	7	7.1	0	0	7
10-20 years	8	8.2	5	8.8	13
20-30 years	16	16.3	10	17.5	26
30-40 years	21	21.4	13	22.8	34
40-50 years	28	28.6	12	21.1	40
>50 years	39	39.8	16	28.1	55
<b>Total</b>	98	56	57	32.6	175



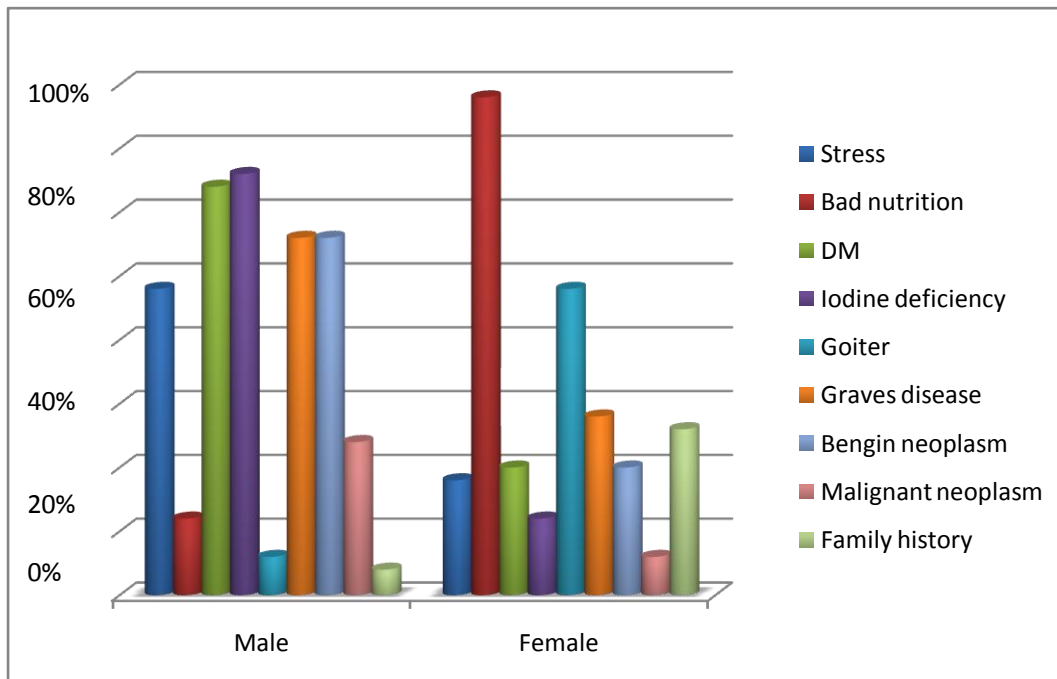
**Table 2:-** Sex distribution in relation to thyroid dysfunction among patients with thyroid disorders in King Khalid Hospital , Hail region , Saudi Arabia during the year of 2013.

Disorder	Female		Male		Total
	number	%	number	%	
Patients with hypothyroidism	71	72.4%	27	27.6%	98
Patients with Hyperthyroidism	31	54.4%	26	45.6%	57



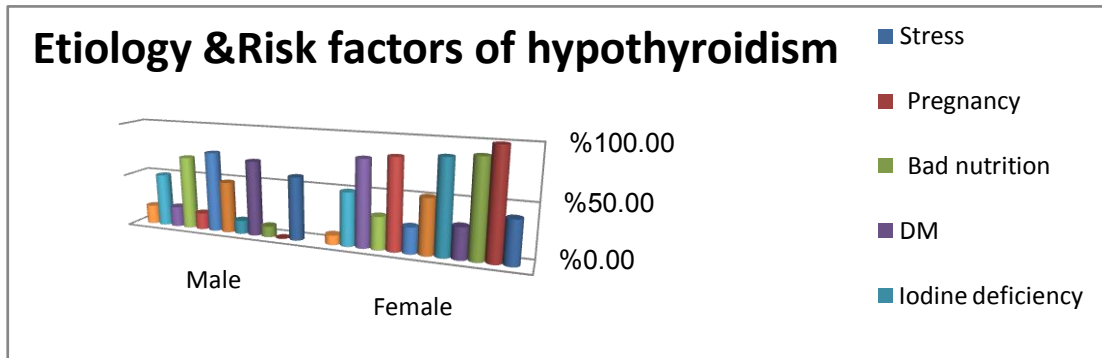
**Table 3:-** Etiology and risk factors of hyperthyroidism among patients with thyroid disorders in King Khalid Hospital, Hail region , Saudi Arabia during the year of 2013.

	Males		Females		\Total
	Number	%	number	%	
Risk factors					
<b>Stress</b>	24	72.7%	9	27.3%	33
<b>Bad nutrition</b>	6	13.3%	39	86.7%	45
<b>DM</b>	32	76.1%	10	23.8%	42
<b>Iodine deficiency</b>	33	84.6%	6	15.3%	39
<b>Etiology</b>					
<b>Goiter</b>	3	11.1%	24	88.9%	27
<b>Graves' disease</b>	28	66.7%	14	33.3%	42
<b>Benign neoplasm</b>	28	73.7%	10	26.3%	38
<b>Malignant neoplasm</b>	12	80.0%	3	20%	15
<b>Family history</b>	2	13.3%	13	86.6%	15



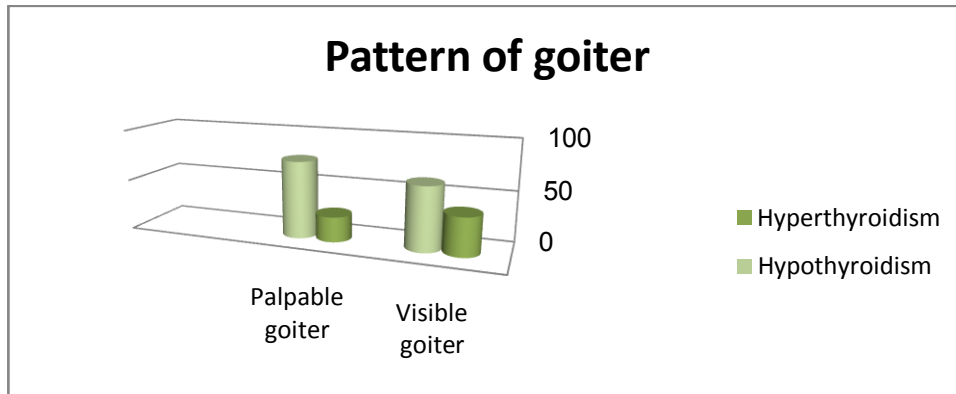
**Table 4:-** Etiology and risk factors of hypothyroidism among patients with thyroid disorders in King Khalid Hospital, Hail region, Saudi Arabia during the year of 2013.

	Female		Male		Total cases
	Number	%	number	%	
<b>Risk factors</b>					
Stress	13	40.6	19	59.4	32
Pregnancy	57	100	-	0	57
Bad nutrition	53	89.8	6	10.2	59
DM	15	29.4	36	70.6	51
Iodine deficiency	41	87.2	6	12.8	47
<b>Etiology</b>					
Goiter	32	51.6	30	48.4	62
Hashimoto thyroiditis	10	24.4	31	75.6	41
Benign	43	84.3	8	15.7	51
Malignant	4	30.8	9	69.2	13
Family history	59	80.8	14	19.2	73
Radiation	1	50	1	50	2
Congenital	1	33.3	2	66.6	3



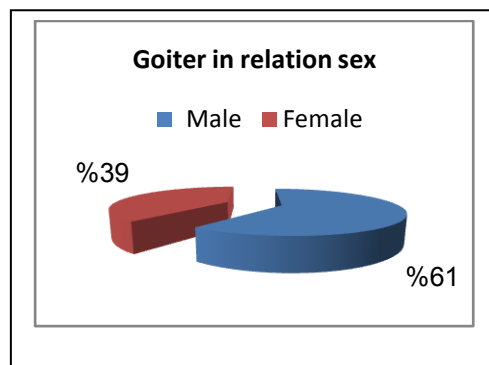
**Table 5:-** Classification of goiter in relation to thyroid dysfunction among patients with thyroid disorders in King Khalid Hospital, Hail region, Saudi Arabia during the year of 2013.

Goiter	Hyperthyroidism		Hypothyroidism		Number of patient with goiter
	number	%	number	%	
Visible goiter	15	37.5	25	62.5	40
Palpable goiter	12	24.5	37	75.5	49
<b>Total</b>	27	30.3	62	69.7	89



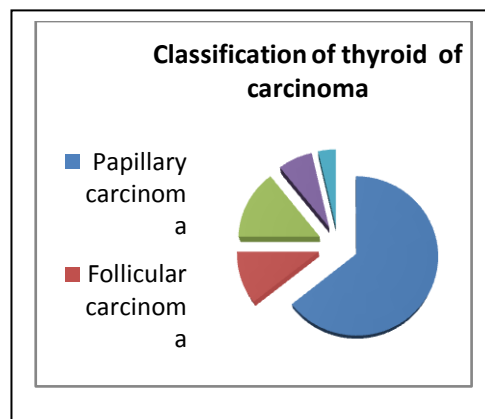
**Table 6:-** Classification of goiter in relation to sex among patients with thyroid disorders in King Khalid Hospital , Hail region , Saudi Arabia during the year of 2013.

Goiter in relation to sex	Patients	
	Number	%
Male	54	60.7
Female	35	39.3
Total	89	100



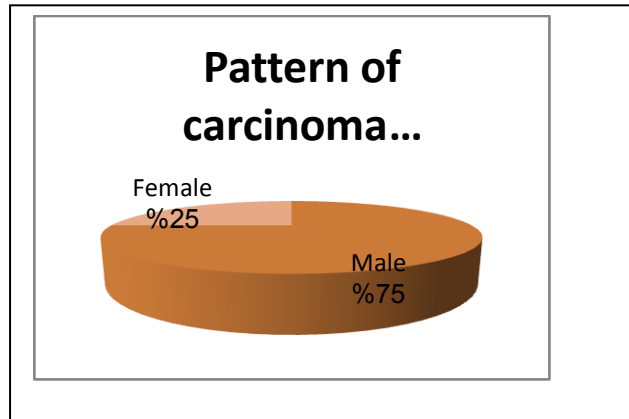
**Table 7:-** Pattern of thyroid carcinoma among patients with thyroid disorders in King Khalid Hospital, Hail region , Saudi Arabia during the year of 2013.

Pattern of thyroid carcinoma	Patients with thyroid carcinoma	
	Number	%
Papillary	18	64.3
Follicular	3	10.7
Medullary	4	14.3
Undifferentiated	2	7.1
Metastatic	1	3.6
Total	28	100



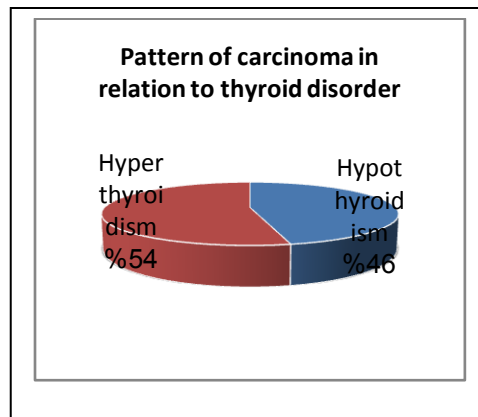
**Table 8:-** Pattern of thyroid carcinoma in relation to sex among patients with thyroid disorders in King Khalid Hospital, Hail region , Saudi Arabia during the year of 2013.

Pattern of carcinoma according to sex	Patients	
	Number	%
Males	21	75
Females	7	25
Total	28	100



**Table 9:-** Pattern of thyroid carcinoma in relation to thyroid dysfunction among patients with thyroid disorders in King Khalid Hospital, Hail region , Saudi Arabia during the year of 2013.

Pattern of carcinoma	Patients	
	Number	%
Hypothyroidism	13	46.4
Hyperthyroidism	15	53.6
Total	28	100

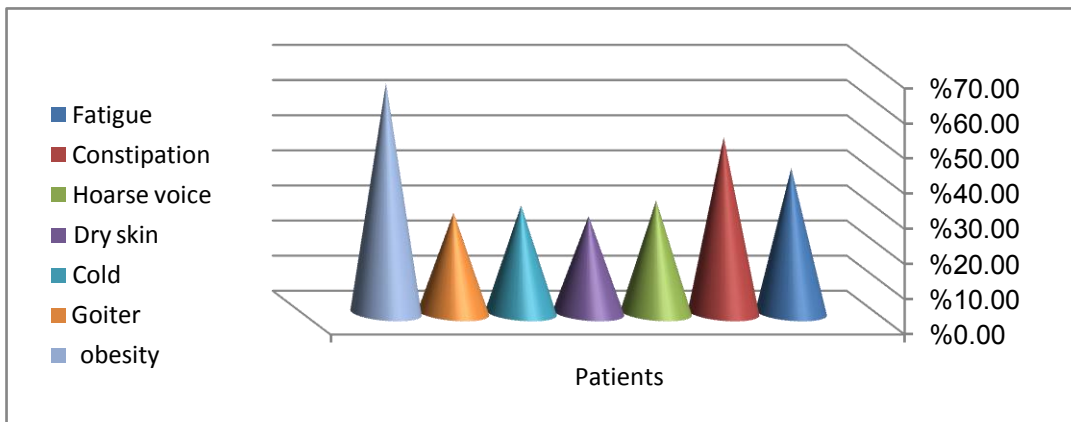


**Table 10:-** clinical manifestation of hypothyroidism among patients with thyroid disorders in King Khalid Hospital, Hail region, Saudi Arabia during the year of 2013.

Clinical manifestation	Patients	
	Number	%
Fatigue	42	42.8%
Constipation	49	50%
Hoarse voice	32	32.6%
Dry skin	27	27.5%
Cold	30	30.6%

Goiter	28	28.5%
Obesity	64	65.3

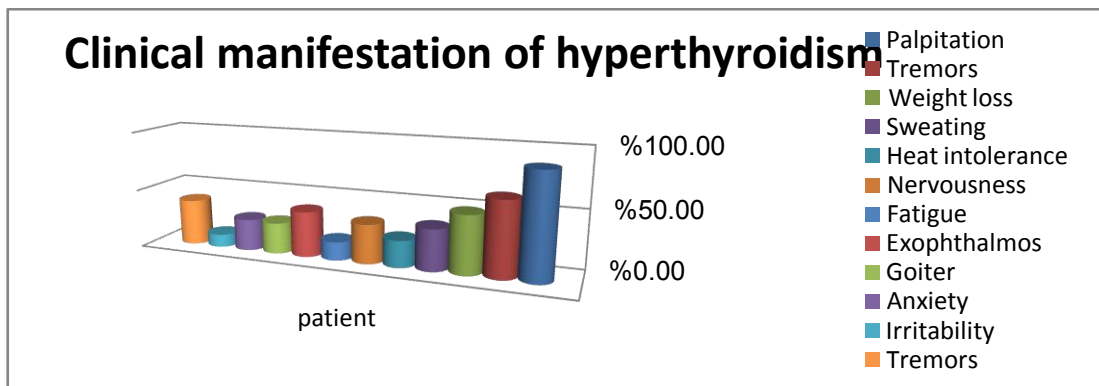
Total number of patients with hypothyroidism : 98



**Table 11:-** clinical manifestation of hyperthyroidism among patients with thyroid disorders in King Khalid Hospital, Hail region, Saudi Arabia during the year of 2013.

Clinical manifestation	Patient	
	number	%
Palpitation	50	87.7
Tremors	36	63.2
Weight loss	28	49.1
Sweating	20	35.1
Heat intolerance	13	22.8
Nervousness	19	33.3
Fatigue	9	15.7
Exophthalmos	22	38.6
Goiter	15	26.3
Anxiety	15	26.3
Irritability	6	10.6
Tremors	22	38.6
<b>Total</b>	57	100

Total number of patients with hyperthyroidism :57





**Discussion:-**

Diseases of the thyroid are of great importance because most are amenable to medical or surgical management. Patients with thyroid diseases usually presented by conditions associated with excessive release of thyroid hormones (hyperthyroidism), deficiency of the hormone hypothyroidism), and mass lesions of the thyroid (**Maitra et al ;2008**)

Risk factors of thyroid disease include: Gender, Diet rich in goitrogens or deficient in iodine , Pregnancy , Radiation to the neck , Family history and Smoking (**Marita et al , 2008** )

Hypothyroidism results from deficient production of the thyroid hormone or defects in thyroid hormone receptor activity. The disorder may be acquired or congenital manifested at birth or delayed as a result of a variety of congenital defects. Congenital causes of hypothyroidism may be sporadic or familial (**Ordoorkhani et al., 2005**).

The current study revealed that out of 175 patients , 98 cases ( 27 male and 71 female ) was found to have hypothyroidism and 57 (26 male and 31 female) had hyperthyroidism .likewise , it was documented by many authors that hypothyroidism is more common in females while hyperthyroidism is more common in males ( **Martin ; 2013.**) In addition stress ( 59.4% ) , malignant tumors ( 75% ) , Hashimooto thyroidiis , and DM as risk factors of hypothyroidism were more prevalent in males than females. While the common risk factors in females were bad nutrition , iodine deficiency , goiter , benign thyroid tumor and family history were more prevalent in females with hypothyroidism comparable with males (**Wang et al ;1997 &Morganti et al ; 2005**)

Similarly , Flynn et al ;2004 reported that conditions such as bad nutrition and poorly controlled diabetes were among causes of hypothyroidism in females . Our results on the contrarily revealed that the uncontrolled DM was found as a risk factor in males . **Akbar et al. 2006** as well as our study reported that family history of hypothyroidism is associated with an increase risk and the role of familial susceptibility to thyroid disorders was highly related . Congenital hypothyroidism in the current work increased significantly in males (18 %) than in females (9 %) which is in consistent with the study of Wintergerst et al ( **Wintergerst et al ;2014** ) .

Concerning hyperthyroidism , stress , DM , graves disease , benign and malignant tumors were common in males . Moreover , bad nutrition , iodine deficiency , goiter , family history and radiation were the more frequent in females . Likewise same results were obtained by Abdul Shakoore et al while other authors didn't find relation with family history to thyroid diseases (**Abdul Shakoore et al 2014** )

Iodine deficiency was associated with hypothyroidism in females but it was common in males with hyperthyroidism .likewise high iodine deficiency was recorded in hypothyroidism females and hyperthyroidism males. Epidemiological studies has shown that pattern of thyroid dysfunction in a community is largely determined by iodine intake level (**Knudsen et al. 2000**). Kutras (2001) reported that iodine deficiency, thyroid autoimmunity, infection and previous irradiation are the common etiological factors of thyroid disorders In iodine deficient communities incidence of hypothyroidism is low while nontoxic goiter and hyperthyroidism due to toxic nodular goiter is common and increases with age. Like the results of the present study , high incidence of Hashimoto thyroiditis was recorded in hypothyroidism males. Hanna and **LaFranchi** (2002) reported that thyroid autoimmune diseases like Graves' disease and Hashimoto's thyroiditis are common reason of thyroid diseases. **Takasu et al.** (1990) described eight cases of autoimmune thyroid disease with an alternating pattern of thyroid function.

Goiter in the present study was found to be higher in males (60.7%) than in females(39.3%) . On the other hands **Elhai et al** (2005) reported an incidence of 60.6% in females. This may be due to the kind of their patients which were referred from a centre for nuclear medicine . On the contrarily one again , **Al-Bouq et al.** (2006) reported that the incidence of goiter was much less than that of ours (19.6%) in Medinah Munawarah ,Saudi Arabia. A high incidence of goiter was also recorded in Gizan,Saudi Arabia (**Sulimani et al. 1995**), Bombay, India (**Dodd and Samul ,1993**) and Tunisia (**El-May et al.1997**). The appearance of goiter depends on many factors like sex, family history, iodine intake and thyroid autoimmunity. Low iodine intake enhances the TSH sensitivity and positive influence of growth factors involved in the physiological regulation of thyroid growth.

In Saudi Arabia thyroid cancer is the fourth most common cancer in all age and the second most common cancer in female ( **National Cancer Registry ;1997**).

The number of cases with malignant thyroid in the current study among cases admitted to the endocrinology clinic was 28 (12.9 % and 9.2 % in hypothyroidism and hyperthyroidism, respectively). It was reported that incidence of malignant thyroid varies from one geographical area to the other. It was recorded as 13% in Asir, (Abu-Eshy et al ; 1994) and 21% in Riyadh (Al-Tameem , 1987) There are different causal factors of malignant thyroid such as prolonged high level of TSH and iodine deficiency (Belfiore et al.1992).

Papillary carcinoma in the present work was the most common histological subtype (64.3%) followed by medullary carcinoma(14.3%) , then follicular variant (10.7%) .The least was the undifferentiated (7.1%) . In a retrospective study done by Hussain et al ; 2013 during the year of 2000-2010 to investigate the Incidence of thyroid cancer in the Kingdom of Saudi Arabia, Similar pattern was recognized ( Hussain et al 2013 ) This figure is lower than that found in The Republic of Yemen (21%). (Al-Hureibi et al ; 2004) Our finding further coincides with the study carried out in Riyadh ( Alghamdi. Et al ; 2014)

Thyroid nodule presenting as either a solitary nodule or a multinodular goiter (Mazzafferri; 2004 ) . Most of thyroid nodules are more common in women. One or more palpable thyroid nodules affect 4% of the adult population; most of these nodules are benign (Rossi ; 2006). Majority of solitary nodules of the thyroid proved to be localized, non-neoplastic conditions (Mazzafferri; 2004 ) . Likewise , our results confirmed this fact as most of our patients with solitary nodules were found negative for malignancy .

In the present study , it was found that the cancer was more more frequent in males ( 75% ) than females (25%) . Similar results was obtained by ( Hussein et al 2013) . Considerable geographical variations were present in thyroid cancer incidence in Saudi Arabia.( Bazarbashi et al ; 2008)

In the present study , most of the patients with hyperthyroidism were complaining of palpitation ( 87.7% ) and tremors ( 63.2% ) .

About half of the case ( 49.1% ) had weight loss and (35.1%) had sweating .Others had exophthalmos , goiter , exophthalmos and irritability .Similarly symptoms recorded by (Michelageli et al ,200 ) were palpitation, tremors and weight loss each were over 50%. Other symptoms recorded included excessive sweating (45%), heat intolerance (31%), and nervousness (27%). On the hand, exophthalmos, tremors, and tachycardia ranked top on the list of clinical signs representing over 40% for each. However they added clinical manifestation that not included in the present work which were Proximal myopathy ( 8% ) and atrial fibrillation (4%) of patients. Graves' ophthalmopathy in their study was noted in 54% of their patients.

### **Conclusion:-**

Thyroid disorders are common in Hail region specially in females .The pattern is more or less similar to that detected in other Saudi cities. Goiter and malignant thyroid are more common in males .

### **Recommendation:-**

More studies should be carried out in Hail region to stress on the individual thyroid disorder so as more comprehensive studies could be obtained .

### **Limitation of the study:-**

This hospital-based retrospective study, included those attended the king Khalid hospital only . To represent Hail region as a whole , the study should extend to cover more areas of hail region specially the remote villages .

### **Acknowledgment:-**

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