

## PATTERN OF THYROID CANCER IN IRAQ FROM 2000-2016

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### ABSTRACT

**Introduction:** Thyroid cancer; though a relatively rare neoplasm, it is the second malignancy among Iraqi women and the eighth among men. Thus, the current study aims to identify the trend in incidence rate of thyroid cancer in the last sixteen years 2000-2016. **Method:** A cross sectional study where data were collected from three sources: The Cancer Registry- Ministry of health, Al Amal national hospital for cancer management and Baghdad center for radiotherapy and nuclear medicine. Data were collected from the 1<sup>st</sup> of February up to the end of April, 2019. Data were refined and stored in excel files that later transferred to SPSS version 22 and were presented in tables, graphs, frequencies, percentages and incidence rates. **Results:** The current study illustrated that thyroid cancer incidence is increasing from 2000 (1.07/10<sup>5</sup>) up to 2016 (2.96/10<sup>5</sup>). Nineveh (7.2/10<sup>5</sup>) came the first in thyroid cancer incidence rates, followed by Al Muthana (6.2/10<sup>5</sup>) and Al Diwaniya (5.07/10<sup>5</sup>). The current study showed a higher incidence rate among females compared to males in Iraq. Thyroid cancer cases start to pick up by the thirties and continue to increase with advanced age. Papillary carcinoma is the common morphology. **Conclusion:** An increased incidence of thyroid cancer in Iraq thus encouraging cancer researching in areas of high incidence to identify risk factors specific to that region, enlighten the environmental changes that might have taken place and provide a better understanding for the rise in new cases is essential at this phase.

**KEYWORDS:** Pattern, Thyroid Cancer, Iraq, 2000-2016.

### INTRODUCTION

Thyroid cancer; though a relatively rare neoplasm worldwide, it is the second malignancy after breast cancer among Iraqi women and the eighth among men. It is also the most common malignant disease of the endocrine system.<sup>[1-3]</sup> Thyroid cancer incidence and prevalence increased in the world over the past few decades with a trend that involved almost all continents.<sup>[4,5]</sup> The disease also has the highest annual mortality rate compared to other endocrine cancers. The standardized mortality rate of thyroid cancer was 0.5 in both sexes and 0.4 and 0.6 per 100,000 in men and women, respectively, in the world.<sup>[6]</sup> It is one of the most common cancers in the young population. It had been reported that thyroid cancer incidence climbed dramatically especially among women, children, and young adults.<sup>[7,8]</sup> The rising trend of this cancer had been related to better access to medical care and detection of less invasive cases at an early stage, as well as genetic factors and environmental effects.<sup>[4]</sup> Therefore, the rise

could be deceptive because of the useless identification of a large reservoir of papillary lesions that will never affect patient health (i.e. over diagnosis).<sup>[9]</sup> Yet on the other hand, not all epidemiological and clinical data support this hypothesis. The increasing number of large tumors and the increasing thyroid cancer-related mortality in spite of earlier treatment together with the changes in thyroid cancer molecular profile, all suggest a true increase.<sup>[9]</sup> Early diagnoses of subclinical disease; i.e. diagnosing cases through routine neck ultrasound studies, are also becoming more common throughout the world. This increase has generated significant interest in the management of thyroid cancer.<sup>[10]</sup> Efforts for decreasing iodine deficiency have also been reported to improve thyroid cancer outcomes by changing cancers to less aggressive subtypes.<sup>[11,12]</sup> While in Iraq and according to the Iraqi cancer registry 2016, thyroid cancer ranked the eighth (4.39%) among the top cancers with 259 new cases in males and 846 new cases in females, thus making an incidence rate of 1.35 and 4.61 per 100,000 among males and females, respectively.<sup>[2]</sup>

The estimated crude incidence rate of thyroid cancer in 2018, worldwide reaches to 7.4 per 100,000.<sup>[12]</sup> The predominance of thyroid cancer in the EMR and especially the Gulf region,<sup>[13]</sup> necessitates prioritization at national and regional levels. The aim of study is to determine the temporal trends of thyroid cancer incidence in Iraq during the period 2000-2016, and determine the clinical and histopathological profile of thyroid cancer in the period 2014-2019.

## METHOD

The current study is a descriptive cross-sectional research were collected and retrieved from published cancer registries for years 2007-2016 and the remaining data were taken from MOH officials at the cancer registry department for the years from 2000-2006. The compiled data included: age distribution, gender and new cases registered for each year. In addition to the geographical distribution of cases among Iraq provinces. Data taken from the last two sources included all cases diagnosed with thyroid cancer for the period between 2014 to 2019, information extracted included the basis of thyroid cancer diagnosis among cases, morphology (Papillary, Follicular, Hürthle cell or Medullary

Anaplastic), staging: Stage 1 (localized/ in situ), Stage 2 (local cervical invasion), Stage 3 (lymph node positive), Stage 4 (distant metastasis). Also, data about types of treatment (Partial or total thyroidectomy, Radioactive iodine therapy, Chemotherapy, Radiation). As for the Iraqi population data, population estimates were extracted from Central statistical organization records which included information on the number of population for each age category and gender. All registered cases with thyroid cancer from cancer registry, Al Amal national hospital and Baghdad center for radiological therapy and nuclear medicine were included in the study. Data were collected from the 1<sup>st</sup> of February up to the end of April 2019. Data were refined and stored in excel files that later on were transferred to SPSS version 22, data were presented in tables and graphs and as frequencies, percentages and incidence rates.

## RESULTS

The current study illustrated that thyroid cancer incidence is increasing from 1.07 per 100,000 in 2000 up to 2.96 per 100,000 in 2016. Figure (1) demonstrates Iraq's incidence of thyroid cancer, both sexes, 2000 – 2016.

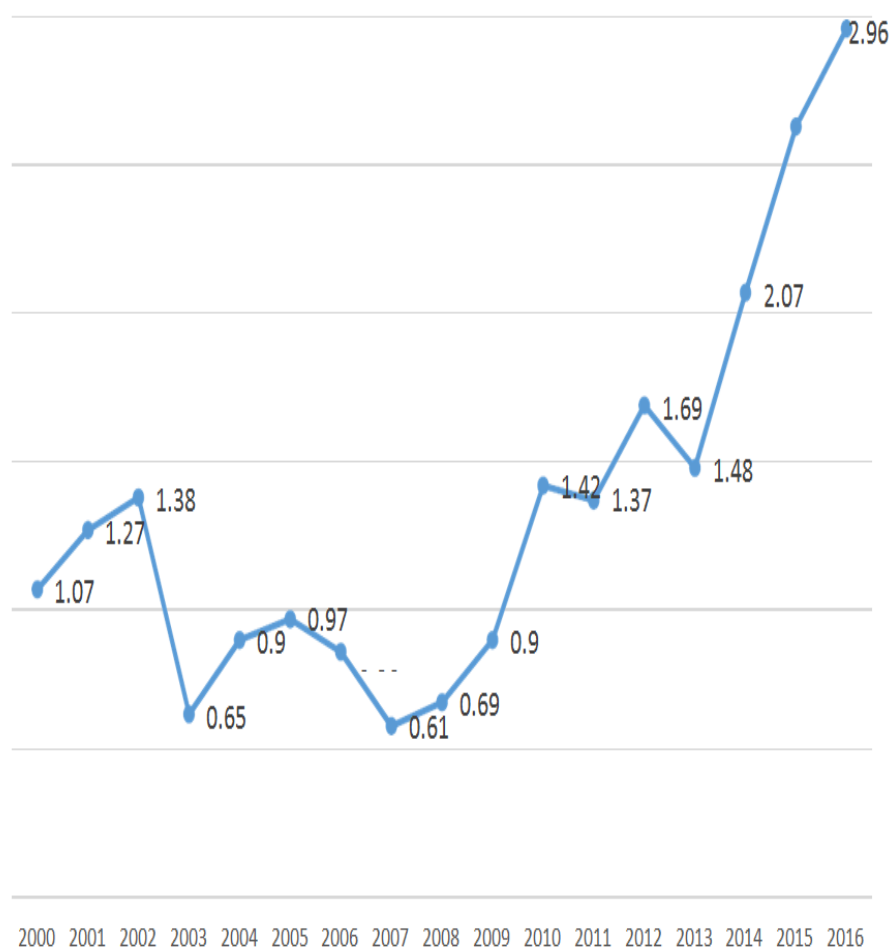
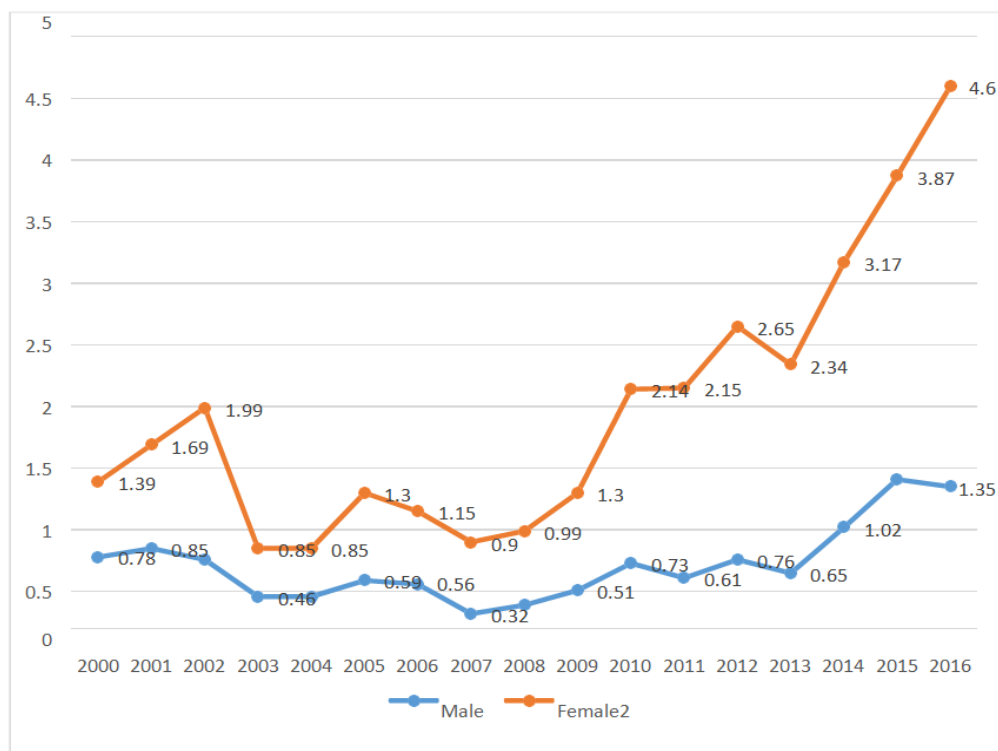


Figure (1): incidence rate (per 100,000 population) of thyroid cancer, both sexes, Iraq, 2000-2016.

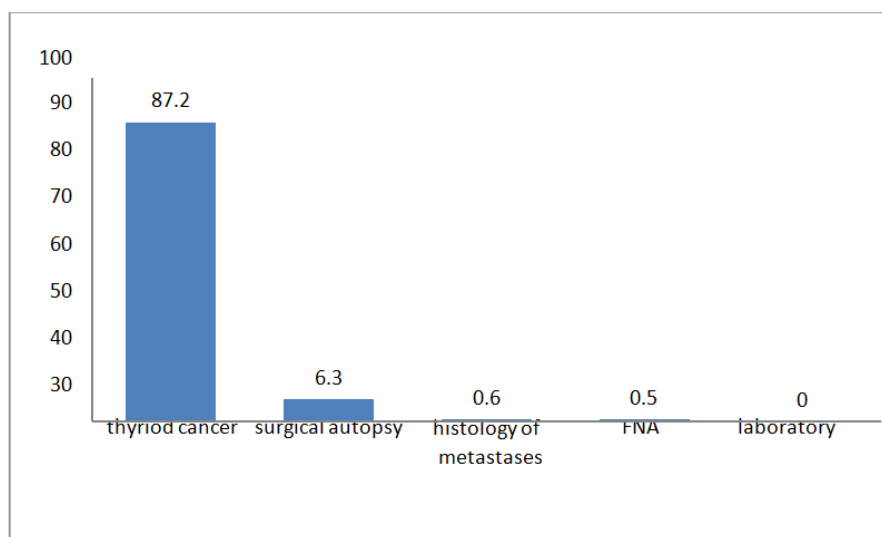
The current study showed a higher incidence rate (per 100,000 population) among females compared to males in Iraq.



**Figure (3) Distribution of males' and females' thyroid cancer incidence (per 100,000) in Iraq, for the years from 2000 to 2016.**

From a total of 3276 cases extracted from Al-Amel hospital and Baghdad center for radiological therapy and nuclear medicine, Majority (87.2%) had been diagnosed histologically as a primary site.

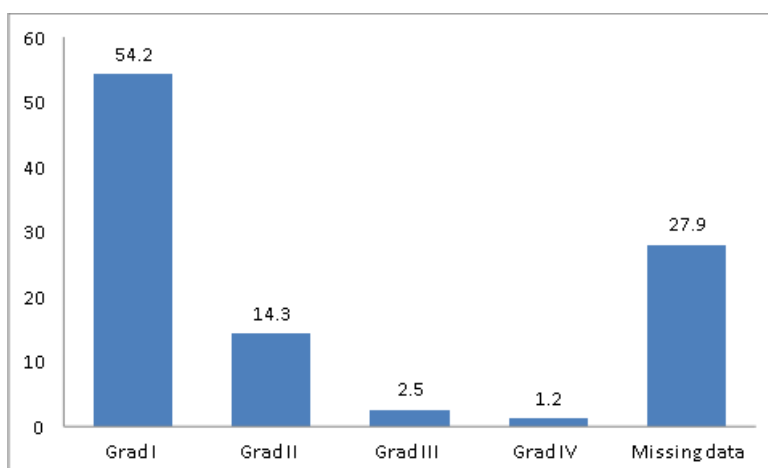
Surgical autopsy (6.3%) were the second way to diagnose thyroid cancer. Only 0.5% of cases were diagnosed by cytology as shown in figure (5).



**Figure 5: Bases of diagnoses of thyroid cancer.**

As shown in figure (6) 54.2% of thyroid cancer diagnosed at grad I, grad II represents 14%, grad III and IV represent 2.5% and 1.2% respectively, while 27.9%

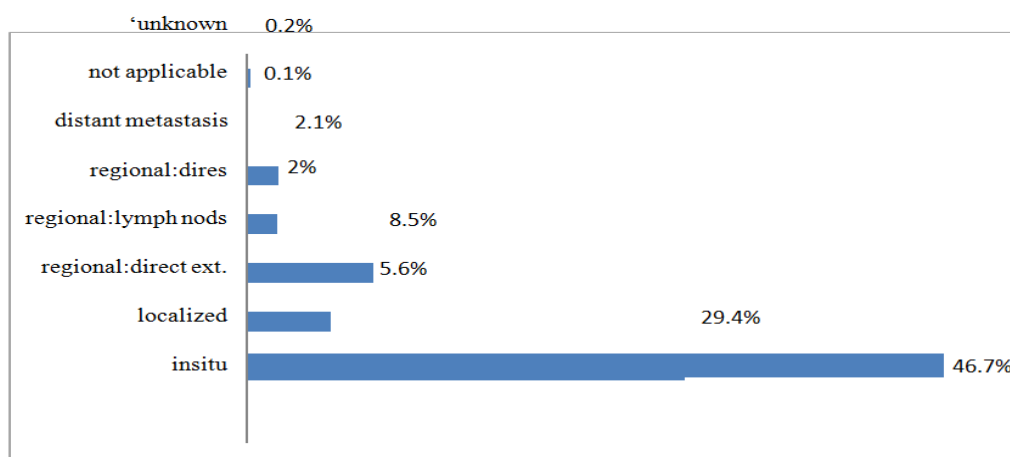
of thyroid cancer remain unknown grad at time of diagnoses.



**Figure 6: Grading of thyroid cancer.**

Results show that less than half (46.7%) of thyroid cancer cases were in situ at the time of diagnoses, 29.4% of cases were localized, 8.5% were with regional lymph

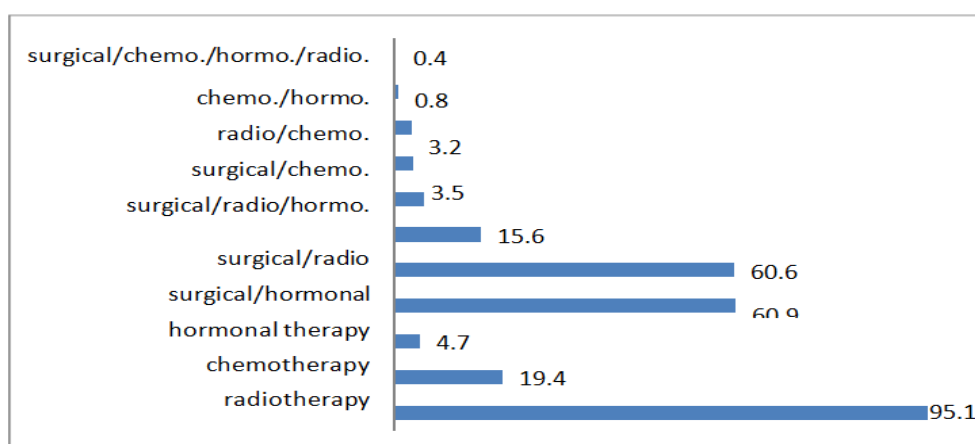
node involvement and 2.1% of cases with distant metastases at time of diagnoses as shown in figure (7).



**Figure 7: Extent of thyroid cancer at time of diagnoses.**

Ninety-five percent of cases of thyroid cancer treated surgically, sixty-one percent of cases received hormonal therapy, nineteen percent treated by radiotherapy, nearly

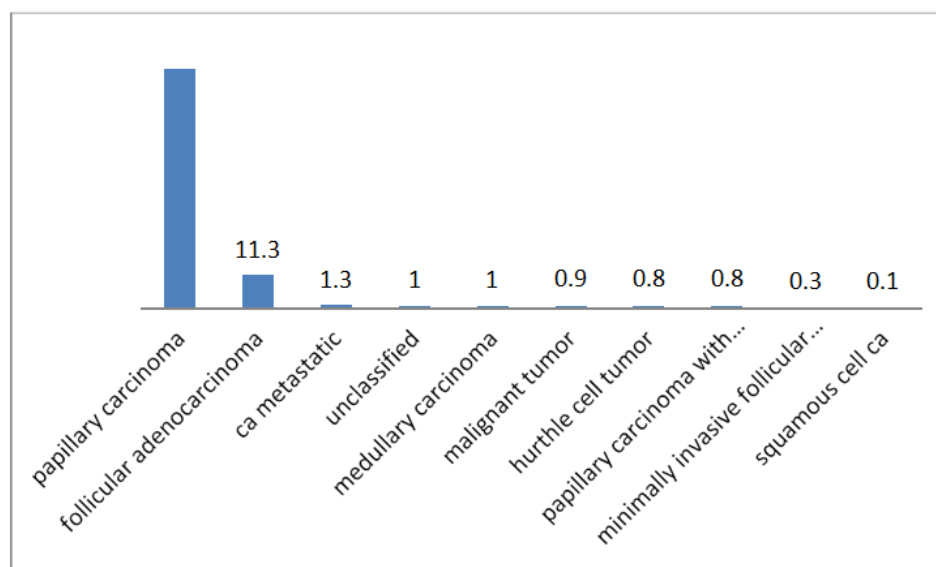
five percent of cases treated with chemotherapy and only 0.3% treated with immunotherapy as shown in figure (8).



**Figure 8: Types of treatment of thyroid cancer.**

Papillary carcinoma is the most frequent type represent 81.5% of cases (papillary carcinoma 48.7%, papillary adenocarcinoma 28.2% and papillary micro carcinoma 4.6%), followed by follicular adenocarcinoma 11.3%,

cancer metastatic 1.3%, unclassified and medullary carcinoma 1%, hürthle cell tumor & papillary carcinoma with follicular carcinoma 0.8% and 0.1% for squamous cell carcinoma as figure (9) shown:



**Figure 9: Morphological types of thyroid cancer.**

## DISCUSSION

The last sixteen years; covered in our study, showed a steady increase in thyroid cancer trends 1.07 per 100,000 in 2000 up to 2.96 per 100,000 in 2016. Such a rise goes in line with worldwide registries of thyroid cancer. For example, in Jordan the reported incidence rates fluctuated from 2.4 per 100,000 in 2007 to reach 3.2 per 100,000 in 2012<sup>[14,15]</sup>. In Egypt, thyroid cancer incidence was 1.1 per 100,000 in 2008<sup>[16]</sup> and was estimated to reach 2.2 per 100,000 in 2018.<sup>[12]</sup> Similarly, Iran reported an incidence rate of 2.20 per 100,000 between 2004-2010 that is expected to reach 4.8 per 100,000 in 2018.<sup>[17]</sup> In China 2.75 per 100,000 in 2000, and increased to 19.42 per 100,000 in 2012<sup>[18]</sup>. Clearly, the current study shows a higher incidence rate (per 100,000 population) among females compared to males in Iraq. Similar results reported in Jordan,<sup>[14]</sup> United Kingdom,<sup>[19]</sup> Canada,<sup>[20]</sup> Turkey,<sup>[21]</sup> Iran,<sup>[22]</sup> India<sup>[23]</sup> and others.<sup>[24]</sup> This gender disparity in thyroid cancer incidence is well established, but our knowledge of the factors that mediate such difference between genders is still not well understood. There is strong evidence that estrogen is involved in the pathogenesis of thyroid cancer in females. However, our knowledge about the influence of this hormone on this tumor is still very limited<sup>[25]</sup>. In the current study, it seems that thyroid cancer cases start to pick up by the thirties and continue to increase with advanced age. This is especially noticed in the last two years covered by the study. i.e. 2015 and 2016. This is earlier than peak age reported in USA (45-54).<sup>[20]</sup> Canada (40-60 years),<sup>[26]</sup> and UK (65- 69).<sup>[27]</sup> Our result agrees with findings from Srinagar- India where peak age of incidence between was between 20-29 years of age followed by 30-39 years' age group.<sup>[23]</sup> Unfortunately, it

had been reported that individuals belonging to the earlier age group of thyroid cancer are presented with a highest prevalence of neuro-vascular invasion, capsular invasion and lymph node metastasis.<sup>[28]</sup> The current study showed that the majority of thyroid cancer cases were diagnosed histologically as a primary site. This indicates the new technologies in investigating the thyroid that probably can be a reason for the high incidence, it had been reported that much of the increase is secondary to increased detection of small, low-risk tumors, with questionable clinical significance<sup>[29]</sup>. In the same context, the current results show that more than half of thyroid cases were of grade one and 46.7% were in situ. This figure is similar to findings reported in India.<sup>[30]</sup> The commonest treatment modality for thyroid cancer is surgical interferences. FNA biopsy it remains the most accurate, cost-effective, and best diagnostic method for evaluating nodules. It is done either by palpation or with ultrasound guide<sup>[31]</sup>. All cytology suggesting malignancy requires surgery with either lobectomy or total thyroidectomy, unless there are contraindications or diffuse metastasis. In the current study only 0.5% of thyroid cancer patient diagnosed by FNA cytology and 87.2% diagnosed by histopathology of primary site (surgical excision). Surgery should be more strongly considered with solid nodules with indeterminate cytology. The American Thyroid Association also recommends thyroid lobectomy for patients with an indeterminate solitary nodule, and total thyroidectomy for large tumors >4 cm and patients who have a high-risk history for malignancy.<sup>[32]</sup>

## CONCLUSION

An increased incidence of thyroid cancer in Iraq thus encouraging cancer researching in areas of high incidence to identify risk factors specific to that region, enlighten the environmental changes that might have taken place and provide a better understanding for the rise in new cases is essential at this phase.

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