

THYROID CANCER INCIDENCE IN SIBIU COUNTY

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Abstract: Thyroid carcinoma is the most common endocrine cancer and represents approximately 1.4% of all new cancer cases. Epidemiological data showed an increase incidence and mortality through endocrine neoplasia in the last two decades. The aim of this study is to analyse the incidence of thyroid cancer in Sibiu County, during 2011-2013 period, related with various environmental and demographic factors, and follows its dynamics during this period. There was an increase incidence of thyroid cancer in Sibiu County: 3.98 to 100 000 inhabitants in 2011, 5.31 to 100 000 inhabitants in 2012 and 6.91 to 100 000 inhabitants in 2013, with a higher incidence in women, especially in urban population, the most frequent form was papillary cancer. Comparing the results with those from the literature, we see the same trend of increased incidence of thyroid cancer.

INTRODUCTION

Thyroid carcinoma is the most common endocrine cancer and represents approximately 1.4% of all new cancer cases. The incidence in Europe in 2012 was 52.937 cases to 100 000 inhabitants, with a mortality of 6334. In Romania, there have been 3.3 per 100 000 inhabitants, with a mortality of 162 persons.(1)

Epidemiological data have revealed an increased incidence and mortality of endocrine neoplasia in the last two decades, the annual rate raised from 0.5 to 10 cases per 100 000 inhabitants.(2)

Identifying the risk factors (exposure to radiation, excess or deficiency of iodine, thyroid pathology of disease, age, heredity) plays an important part in early diagnosis and treatment of thyroid cancer. An important part is represented by radiation exposure, especially after the Chernobyl accident (April 1986), which is the worst nuclear accident in history, with important consequences for the environment and health. It provides for an increase in the number of cases of thyroid cancer since the peak incidence is 25-30 years after exposure. Most of them are papillary carcinoma, more aggressive than those that typically occur, with metastases in the latero-cervical lymph, 30% of which determine lung metastases.(3) The incidence of thyroid cancer increases with age, reaching a plateau after about 50 years of age, this being also a prognostic factor, thyroid cancer at a young age (under 20 years) and in older people (over 45 years) have a worse prognosis. Thyroid cancer is twice as common in women as in men, but male is a factor of poor prognosis.(4) Thyroid carcinomas are classified into five main types, namely: differentiated carcinomas including papillary forms (75-80%) and follicular (11%), Hurthle cell carcinomas (3%), medullar carcinomas (5-10%) derived from C parafollicular cells, anaplastic, or undifferentiated carcinomas (2-5%), lymphoma (5%) and sarcomas. Papillary cancer is the most common histopathological form of thyroid cancer, particularly affecting the decade of 3rd and 4th age and is 3 times more common in women.(4)

PURPOSE

The aim of our study was to analyze the incidence of

thyroid cancer between 2011-2013 in Sibiu County, correlated with demographic and environmental factors, and to follow its dynamics during the period studied. Also, we want to evaluate the most common types of thyroid carcinoma, the main clinical and laboratory changes that may have a close connection with neoplasia.

MATERIALS AND METHODS

We conducted a retrospective epidemiologic study on the incidence of clinical thyroid cancer during a period of three years in Sibiu County. Data was analyzed from the observation charts of patients admitted to the Emergency County Hospital of Sibiu, on Endocrinology, General Surgery and Oncology Departments, for a period of 3 years (1 January 2011 - 31 December 2013). The study includes patients diagnosed with thyroid cancer, with a sample of 61 patients (46 women and 15 men) aged between 20 and 89 years old, and different histological variants of thyroid cancer.

Several parameters were followed, namely: incidence (frequency of new cases of illness reported in the total population in Sibiu County, which in the census of 2012 was 375.992 inhabitants) (46), demographic (age, gender, area of origin), laboratory data (blood count, liver function exploration, renal, coagulation), hormonal status by dosing thyroid stimulating hormone (TSH) and FT4 (thyroid hormone), type of thyroid cancer according to histopathology, co morbidities (metastasis or disease without direct relationship with neoplasia).

RESULTS

In our study, of 61 patients diagnosed with thyroid cancer between 2011 and 2013, 46 were females (75.41%) and 15 males (24.59%), the ratio of women/men was 3/1.

47 patients were from urban areas (77.05%), 14 from rural areas (22.95%).

The distribution by age was as follows: between 20 and 29 years old, there were diagnosed 3 patients (4.92%); between 30 and 39 years old, there was diagnosed one patient

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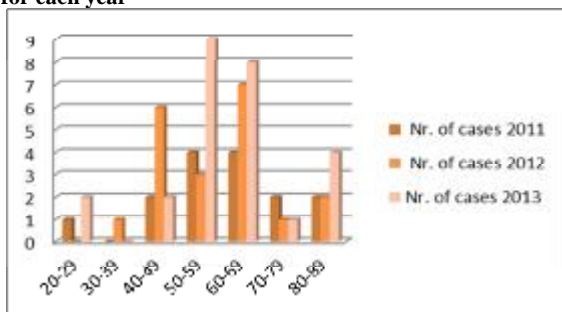
(1.64%); between 40 and 49 years old, there were diagnosed 10 patients (16.39%); between 50 and 59 years old, 16 patients (26.23%); between 60 and 69 years old, 19 patients (31.15%); between 70 and 79 years old, 4 patients (6.56%); and between 80 and 89 years old, there were diagnosed 8 patients (13.11%).

We observed a high incidence in women in the age group between 50 and 59 years old (15 patients) and in the age group between 60 and 69 years old (11 patients). The 15 men included in our study with thyroid cancer were more frequently between 60 and 69 years old, more than half of them (8 patients) (figure no. 1,2).

Table no. 1. Distribution by years and age of patients with thyroid cancer

| Age group (years) | Number of patients - 2011 | Number of patients - 2012 | Number of patients - 2013 | Total |
|-------------------|---------------------------|---------------------------|---------------------------|-------------|
| 20-29 | 1 (6.67%) | 0 | 2 (7.69%) | 3 (4.92%) |
| 30-39 | 0 | 1 (5%) | 0 | 1 (1.64%) |
| 40-49 | 2 (13.33%) | 6 (30%) | 2 (7.69%) | 10 (16.39%) |
| 50-59 | 4 (26.67%) | 3 (15%) | 9 (34.62%) | 16 (26.23%) |
| 60-69 | 4 (26.67%) | 7 (35%) | 8 (30.77%) | 19 (31.15%) |
| 70-79 | 2 (13.33%) | 1 (5%) | 1 (3.85%) | 4 (6.56%) |
| 80-89 | 2 (13.33%) | 2 (10%) | 4 (15.38%) | 8 (13.11%) |
| Total | 15 (100%) | 20 (100%) | 26 (100%) | 61 (100%) |

Figure no. 1. Distribution of thyroid cancer by age groups for each year



From the histological point of view, of the total of 61 of these thyroid cancers diagnosed in 3 years, 48 were papillary carcinomas (78.69%), 8 were follicular carcinomas (13.11%), 4 medullary carcinomas (6.56%) and one anaplastic (1.64%). Papillary cancer, the most common type of thyroid carcinoma was present in 38 women and 10 men.

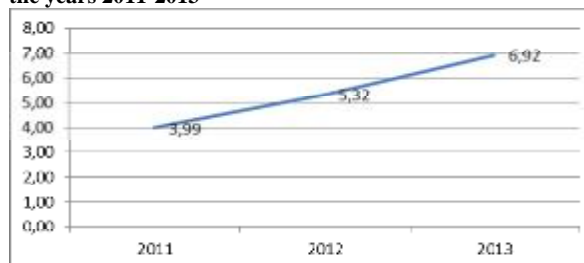
Regarding the symptoms, signs of compression were present as follows: 2 patients (3.27%) had dysphonia, 2 patients (3.27%) dysphagia and 4 patients (6.55%) had dyspnea. Cervical lymph-adenopathy was detected in 10 patients (16.39%). Lung metastases were found in 5 patients (8.19%), lung and liver metastases in 3 patients (4.91%) and renal metastases in one patient (1.63%).

In laboratory examinations have been identified the following changes: iron deficiency anemia in 17 patients (27.86%), hyperuricemia in 8 patients (13.11%), hypocalcaemia in 7 patients (11.47%). In all of the 61 patients, the evaluation of thyroid hormones and TSH demonstrated hyperthyroidism in 4 patients (6.55%), hypothyroidism in 10 patients (16.4%) and euthyroid in the rest of the 47 patients (77.05%).

In 2011, 15 new cases were diagnosed with thyroid carcinoma in Sibiu County Hospital (3.98 cases per 100 000 inhabitants) in 2012 the number of patients increased to 20 (from 5.31 to 100 000 inhabitants) and in 2013 reached 26 patients (6.91 cases per 100 000 inhabitants). Of the 15 patients diagnosed in 2011, 12 were women and 3 men, in 2012, 15

women were affected and five men, and in 2013, there were diagnosed 19 women and 7 men. In 2011, there were 12 cases of thyroid cancer in urban areas and 3 cases in rural areas, in 2012, 14 patients in urban and 6 in rural, and in 2013, there were 21 in urban areas and 5 patients in rural areas.

Figure no. 3. Dynamics of thyroid cancer incidence between the years 2011-2013



In terms of histopathologic type, in 2011 there were detected 11 cases of papillary carcinoma, 3 follicular cancers and one medullary; in 2012 papillary carcinoma was diagnosed in 16 patients, in 3 patients follicular carcinoma and medullary carcinoma in one patient; in 2013, there were 21 cases of papillary carcinoma, 2 cases of follicular carcinoma, 2 medullary and one anaplastic.

DISCUSSIONS

Thyroid cancer is a problem of global concern, mainly due to the constant rise in incidence from year to year. Epidemiological data are influenced by more accurate methods of diagnosis. Regarding mortality, the trend is downward, with a good survival prognosis for differentiated forms.

Analyzing the incidence of thyroid cancer in Sibiu, between the years 2011-2013, we found an increase, from 3.98 to 100 000 inhabitants (2011) to 6.91 to 100 000 (2013). The data exceed the incidence of Romania, which in 2012 was 3.3 per 100 000 inhabitants. Compared to the remaining counties, most cases of thyroid cancer in 2001 were recorded in Cluj (4.28), then in Sibiu (2.83), Bacău (1.93), Constanța (1.82) and Timiș (1.81). Most of them were considered endemic areas, this being a contributing factor of malignancy.(5) Currently, the trend is a raising incidence in all the Romanian counties: in Mureș has been an increase by about 15% in 2009 compared to 2000.(6) In Iași, between 2005-2009, the incidence presents an annual growth of approximately 5%.(7)

A study in one Italian centre on 4 187 cases, 35 years (1969-2004), divided into periods of five years, showed an increase in the incidence of new cases discovered in the first half of the period analyzed, 1 215 cases, to 2 772 cases in the second period. In the first 5 years of the programme, there were diagnosed 786 cases, and in the last 5 years, 266 to 800 suspected cases statistically.(8) In France, there was an increase in new cases of thyroid cancer by 89% in 2005 compared to 1980 associated with an increased mortality rate of 13% compared to the expected 37%.(9)

A recent study in Denmark on the incidence of papillary cancer between 1996 and 2008, conducted on a sample of 1 350 patients diagnosed with this cancer, showing an increased incidence of 1.43/100 000 inhabitants/year in 1996 to 2.16 /100 000 inhabitants/year in 2008. Male/Female ratio was 1/2.9 comparable with the data we obtained, where the ratio female/male was 3/1.(10) Another recent study in Netherlands conducted on 8 021 patients diagnosed during 1989-2009 shows a significant increase in the incidence of thyroid cancer, with an annual estimated growth of about 1.7%, in contrast mortality is declining.(11)

Increased incidence of papillary cancer at the expense of follicular (6/1 ratio in favour of papillary) can be explained by the introduction of universal salt iodization, it is known that follicular variant of thyroid carcinoma is most common in endemic areas determined by the iodine deficiency. Studies show that endemic goiter prophylaxis following the establishment by the introduction of iodized salt in 2009, increased incidence of papillary cancer.(12) In Moldavia introduction of sustained iodine prophylaxis caused an increased of the incidence of papillary cancers from 42.1% (1971-1980) to 62% (1991-2000), reduction of follicular cancer from 47.3% to 25.2%. The ratio of the papillary and follicular cancer has increased from 0.88/1 to 2.48/1.(3) In Greece, Alevizaki indicates an increased incidence of papillary cancer, most of them micro-carcinomas, which represents 51.6% of all cancers operated.(13)

Gender distribution of patients show a higher incidence of thyroid cancer in females 75.4% compared with 24.6% male, male/female ratio is 1/3. There is a higher incidence in females, corresponding with literature data; this can be explained by the presence of estrogenic hormonal land.(14,15)

There is a higher rate of thyroid cancer in urban areas, 77%, compared to rural areas, 23%, with a ratio of 3.3/1. This difference can be explained by higher levels of pollution and radiation, but also because of better accessibility to specialized medical assistance in urban areas.(2)

CONCLUSIONS

The research found an increased incidence of thyroid cancer in Sibiu: 3.98 in 2011, 5.31 in 2012 and 6.91 in 2013. This can be explained by high levels of ionizing radiation in the atmosphere, soil, water, food after Chernobyl accident. The highest incidence of thyroid carcinoma was in the age group 60-69 years; the maximum frequency in women was between 50-59 years and in men between 60-69 years.

The most common was papillary cancer (78.65%). Papillary cancer was more common in women, with a maximum incidence in the age group 50-59 years. Thyroid cancer has shown steady growth in urban areas, while in rural areas, it decreased. The majority, 86.88% of the patients showed no signs of compression.

The study reveals a significant increase in the incidence of thyroid cancer in Sibiu in three years. Comparing to data from the international literature, we see the same trend of increased incidence of thyroid cancer. Thyroid Cancer prevention is not possible in most cases; however, certain steps can reduce the risk, namely: limited exposure to X-ray, endemic goiter prevention, testing family members of a patient with medullar carcinoma, thyroid pathologies and treatment records.

Early diagnosis of thyroid cancer is now possible, by performing thyroid ultrasound and fine needle biopsy. The establishment of a correct treatment results in an increased rate of survival, especially in patients with differentiated carcinomas.

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