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CANCER OF THE THYROID

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INTRODUCTION

When one thinks of cancer, one thinks of a highly malignant tumor, that ordinarily kills the patient within a few years. However, cancer of the thyroid gland generally does not conform to the pattern of carcinoma elsewhere and may run an extraordinarily course over a period of 20 or 30 years, without causing serious symptoms.

Moreover the close relationship of benign tumors, grossly and histologically, to low grade malignant tumors and the difficulty experienced by clinicians and pathologists alike in distinguishing adenoma from a carcinoma, has resulted in confusion as to what constitute a cancer of the thyroid.

The literature has mentioned such terms as lateral aberrant thyroid and benign metastasizing goiter, to describe the low grade carcinomas, which are so small or so benign in appearance that the primary tumor is not recognized. Nevertheless, those tumors are metastasizing carcinomas and because they may cause death, if not properly treated, they should deserve serious consideration (Soetomo Tjokronegoro, 1934).

There are also thyroid tumors described as a typical adenoma or hyperplastic adenomas, without showing any tendency to invade blood vessel or the surrounding tissue. These tumors may recur locally if not completely removed and ultimately like other benign tumors possibly may become malignant. In this study, those tumors are not included as malignant tumors. Only tumors showing invasion of blood vessel or the usual manifestations of malignancy are considered to be cancer (Warren & Meissner, 1953).

MATERIALS AND METHODS

Data are obtained by retrospective study of all thyroid diseases, received by the Dept of Pathology, during a five year period. All are re-examined and reclassified histologically, according the International Histological Classification of Thyroid Tumors (Hedinger & Sobin; WHO -1974).

The years 1972 - 1976 (inclusive) have been selected for this study, because after July 1977 a decentralisation of the pathology services occur, due to the fact that several hospitals in the city of Semarang have their own pathology services.

The thyroid specimens came from several parts of the province of Central Java, especially from the Northern coastal area and also from the Central part of Central Java. A small part,

* Dibawakan pada Seminar Nasional I Gondok dan Kretin Endemik. Semarang, 18 - 20 Desember 1978.

particularly the Southern area of Central Java, mostly sent their material to the nearby located pathological laboratory in the city of Yogyakarta. Autopsy figures have not been included in this study, as apart from coroner's cases, very few autopsies are done.

We have also to keep in mind, that the material studied are highly selective. The patients have been screened, firstly by the patient himself, who does not often consult a doctor, unless the nodule is giving evidence of growth or functional activity; secondly by the internists or family-doctor and lastly by the surgeon. Therefore, the figures presented certainly do not give the true incidence of thyroid cancer, but only the relative frequency as seen in the Dept of Pathology of a teaching hospital. Nevertheless, it may provide us with some useful data.

The tissue sections were stained with the routine H & E staining method; special cases were also stained with the Van Gieson, Reticulin and PAS staining method.

RESULTS

Out of a total of 39.216 surgical specimens, received during the five year period, 4405 were diagnosed as malignant tumors. Totally there were 790 thyroid cases, consisting of 119 malignant subacute, 157 benign tumors, 437 nontoxic goiters, 23 Grave's diseases, 45 thyroglossal ducts, 5 subacute thyroiditis cases, 1 case of Riedel's thyroiditis, 2 Hashimoto's diseases and 1 case of Cretinism. The relative frequency in relation to other malignant tumors during that period was estimated as 2,7%.

The histological classification is shown in Table-II and all thyroid carcinomas are classified into four major groups.

TABLE I
Several types of Thyroid diseases, in relation to sex distribution

Type of disease	Male	Female	Total	Percentage
Carcinoma	23	96	119	15,1 %
Adenoma	21	136	157	19,9
Nontoxic goiter (nodular/diffuse)	56	381	437	55,4
Grave's disease	3	20	23	2,9
Thyroglossal duct	24	21	45	5,6
Subacute thyroiditis	1	4	5	0,6
Riedel's thyroiditis	1	—	—	0,1
Hashimoto's disease	—	2	2	0,3
Cretinism	—	1	1	0,1
T o t a l	129	661	790	100,0

The four major types of carcinoma of the thyroid are :

1. Papillary carcinoma. All tumors with neoplastic papillae, regardless of the presence of follicular or solid areas, are classified as papillary carcinomas. Tumors, without papillae are also regarded as papillary carcinomas, if the nucleus is large, pale, hypochromatic with invisible nucleolus (so called ground glass type) and the mode of growth is infiltrating into the surrounding tissue. All papillary tumors are regarded as malignant.

2. Follicular carcinoma. Tumors without neoplastic papillae, but display follicular or trabecular structures, are classified in this group. Only follicular tumors, which show vascular invasion or true capsular infiltration are considered malignant.

3. Medullary carcinoma. This type contains amyloid in the stroma.

4. Anaplastic carcinoma. This group includes undifferentiated carcinoma, as well as spindle cell carcinoma, round cell carcinoma, giant cell carcinoma and other rare types.

The predominant type in our material is the papillary carcinoma, in both sexes and in all the age groups, representing 68,9% of all thyroid carcinomas. No medullary carcinoma has been found in our five year record.

TABLE II
HISTOLOGICAL CLASSIFICATION

Percentage	No. of cases	Type
1. Papillary carcinoma	82	68,9%
2. Follicular carcinoma	35	29,4
3. Anaplastic carcinoma	2	1,7
4. Medullary carcinoma	—	—
Total	119	100,0%

TABLE III
SEX DISTRIBUTION of patients with THYROID CA.

Sex	Papillary Ca.	Follicular Ca.	Anaplastic Ca.	Medullary Ca.	Total Total
Female	69	23	2		94
Male	13	12			25
Total	82	35	2		119

TABLE IV
AGE DISTRIBUTION of patients with THYROID CA.

Years	Papillary Ca.	Follicular Ca.	Anaplastic Ca.	Medullary Ca.	Total
10-19	6	-			6
20 - 29	11	3			14
30 - 39	18	3			21
40 - 49	17	11	2		30
50-59	13	12			25
60-69	13	5			18
70 - 79	4	1			5
Total	82	35	2		119

The sex distribution (Table-III) shows an excess in the female patients with a female/male ratio approximately 3,8 : 1 for all histological types.

Papillary carcinomas are found in all age groups, while follicular carcinomas principally occur in the older age groups.

DISCUSSION

Carcinoma of the thyroid gland is not common. In this study, the relative frequency of thyroid carcinoma is 2,7% of all malignant tumors, between 1972 and 1976 inclusive. Data from other Departments of Pathology connected with teaching hospitals in several places in Indonesia, show the following relative frequencies : Jakarta 1,9% (Kusumawidjaja, 1971), Bandung 1,55% (TOPO HARSONO, 1973), Surabaya 2,6% LUSIDA et al., 1977), Medan 1,35% (RIDJAB et al., 1977). Ujung Pandang 2,4% (SYARIFUDIN et al., 1977), Yogyakarta 1,5% (SOERIPTO et al., 1977). Therefore, the relative frequencies of thyroid carcinoma as observed in several pathology laboratories do not differ too much.

Population based cancer registration is not yet established in Indonesia, and the true incidence rate of thyroid cancer is still uncertain. However, we had calculated the age-standardized minimum incidence rate of cancer in the population of the city Semarang, between 1970 - 1974 inclusive, based on microscopically diagnosed cancer. During that period, the age-standardized minimum incidence rate for thyroid cancer was as follows : males 0,90; females 2,12 and for both sexes 1,54 per 100.000 per year. (TIRTOSUGONDO et al., 1976). The city Semarang is located in a non-goitrous area.

Western countries with comprehensive population based cancer registries, show an incidence around 1% of all cancer types.

On the other hand, age-standardized incidence rates reported from Hawaii, Cali (Colombia) and Israel are high, while Iceland, Mozambique and Yugoslavia have moderate rates and most other countries show low rates (DOLL et al., 1966).

Etiological factors in carcinoma of the thyroid are obscure and very controversial, particularly the association between non-toxic goiter and carcinoma. In the past, an association between endemic goiter and thyroid carcinoma was considered important. Wegelin (1928) observed, that thyroid cancer was tentimes more common at autopsy in Bern, Switzerland, an endemic goiter area, than in Vienna and Prague, areas of modest endemicity, where the incidence of thyroid cancer was intermediate.

Recently the widely held believe that nodular non-toxic goiter predisposes to the development of thyroid carcinoma has been modified. PENDERGRAST et al. (1961) have shown that the marked fall in the incidence of goiter in the U.S.A. since the First World War, after the introduction of iodised salt, has not been accompanied by a decrease in the mortality or morbidity from thyroid cancer.

Previously, SAXEN and SAXEN (1954) reported that thyroid cancer in Finland is equally prevalent in areas with and without endemic goiter. Following the introduction of iodised salt in Bern (Switzerland), thyroid cancer has not decreased in incidence, although the pattern has changed; a decrease in the incidence of follicular carcinoma was accompanied by a rise in the incidence of papillary carcinoma, resulting in an unchanged overall incidence (WALTHARD,

1961). WAHNER et al. (1966) have produced evidence of an association between follicular carcinoma and nodular endemic goiter in Cali, Colombia and also a clear lack of correlation between papillary carcinoma and endemic goiter. Riccabona (1973) in his survey in Tyrol, Austria, which is an endemic goiter area, also concluded that the incidence of thyroid cancer was no greater than that reported in goiter free areas. De Smet (1960) working in the Congo, Africa, also stated that he had not observed the evolution of endemic goiter into carcinoma.

As mentioned above, our material mostly came from patients who live in the northern part of Central Java province, a non-endemic goiter area. Only 113 specimens came from areas (14,3% out of the total of 790 thyroid specimens), where endemic goiter is known or presumed to exist (Bojolali, Salatiga, Wonosobo, Banjarnegara and Wonogiri).

TABLE V
Thyroid specimens from endemic goiter areas, received between 1972-1976, inclusive

Carcinoma	Adenoma	Nodular/diffuse non-toxic goiter	Cretin	Thyroglossal duct	Total	
No. of Cases	14	19	17	1	2	113

We have not been able to find any malignant transformations or changes in the nodular goiters until so far. Certainly, our material is not large enough to draw any positive conclusion. More data, especially from endemic goiter areas in Central Java should be compiled. Of course, it is still possible that many nodules, particularly the solitary ones, are potentially cancerous from the onset.

But, it is interesting to note, that the predominant type of thyroid carcinoma from the endemic goiter areas of the follicular type. (Table-VI).

TABLE VI
Distribution of thyroid cancer types in non-endemic goiter and endemic goiter areas, from material received by the Dept of Pathology, 1972-1976.

Cancer type	Endemic goiter area	Non-endemic goiter area	Both.
Papillary	2 (14,3%)	80 (76,2%)	82
Follicular	12 (85,7%)	23 (21,9%)	35
Anaplastic		2 (1,9%)	2
T o t a l	14 (100,0%)	105 (100,0%)	119

Taking into consideration, the observation and conclusion of Wahner et al. (1966) and also more recently the observation of Mc Gill (1978) in Kenya, Africa, and lastly our own figures regarding that carcinoma of the thyroid gland from patients who live in endemic-goiter areas are predominantly of the follicular type, we may suggest a possible positive correlation between follicular carcinoma and endemic goiter.

Again, more adequate data should be collected from regions known as endemic goiter areas in the province of Central Java, especially in connection with the cancer problem. Therefore, we would like to suggest the introduction of fine needle aspiration biopsy for cytologic examination as a method to improve our knowledge in the real incidence and cancer risk factors in endemic goiter areas. In contrast to the large needle biopsy, which most surgeons believe should be done in the hospital, the fine needle aspiration biopsy is a simple office procedure and certainly more applicable to meet our purpose. (Crile et al., 1973; Wang et al., 1976 Gerahengorn et al., 1977).

SUMMARY

1. Thyroid carcinoma accounts only 2,7% of all malignant tumors, diagnosed at the Dept of Pathology Kariadi Hospital/Diponegoro University-Medical Faculty, during the years 1972 - 1976 inclusive. The female/male ratio is approximately 3,8 : 1.

2. Papillary carcinoma is the major type (68,9%) of all thyroid cancers (119 cases) and occurs in all age groups. On the other hand, follicular carcinoma (29,4%) is principally found in the older age groups.

3. Specimens of thyroid cancer from patients living in endemic goiter areas show a preponderance of the follicular type. A possible correlation between follicular carcinoma and endemic goiter has been suggested.

4. More adequate data should be collected from endemic goiter areas in Central Java and fine needle aspiration biopsy for cytologic examination has been proposed as a method to improve our knowledge concerning the cancer problem in goitrous areas.

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