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Thyroid Cancer in Children in Norway 1953–1987

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All cases of thyroid cancer in children aged 15 years or younger registered in Norway (1953–1987) are presented. 30 girls and 5 boys are included, the youngest being a 6-year-old boy. Half of the patients were in the age-group 14–15 years. As for adults, papillary thyroid cancer was most common. 70% of the patients presented with tumour growth outside the thyroid gland. In spite of this, only 2 children died of the disease during the follow-up time (maximum 37 years).
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INTRODUCTION

CANCER OF the thyroid gland is uncommon in most countries, accounting for about 1–2% of all registered new cancer cases in the general population. Among childhood malignancies it is even more rare, constituting 0.5% of all cancer in children in Norway [1]. It has, however, an interesting epidemiological profile with high risk in iodine-rich areas such as Iceland and northern Norway [2, 3]. The prognosis is considered to be good, depending on variables such as age, sex, stage and histological type. In a multivariate analyses published from the Norwegian Thyroid Cancer Project including 1026 differentiated tumours, only age and stage were of significant prognostic value[4].

Most articles on thyroid cancer in childhood are based on hospital records and thus are highly selected, focusing on clinical data [5, 6]. The present material includes all cases of thyroid cancer in children 15 years or younger reported to population based Cancer Registry of Norway.

MATERIALS AND METHODS

Since 1953 the Cancer Registry of Norway has received data on all cancer patients. Several types of data are stored based on clinical reports, histology and cytology reports as well as autopsy records. Death certificates on all cancer patients are received via The Central Bureau of Statistics of Norway. All available slides were reviewed (19 patients). The remaining histopathology-reports were re-read, recoded and all slides were classified according to the WHO [7]. Stage 1 includes tumours within the thyroid gland; no metastases found at the time of diagnoses. Stage 2 means regional metastases either in lymph nodes or in the adjacent soft tissue. Patients with distant metastases were classified as stage 3. Information on relapses and treatment were given on the clinical reports from the hospital responsible for treatment. The follow-up time varied from 2–37 years with a median of 17 years.

RESULTS

In the 35 year-period 1953–1987, 35 new cases of thyroid cancer in children 15 years or younger occurred in Norway, giving an average of 1 case per year in a population of about 1 million children in this age-group (Table 1). The figures are small, but there does not seem to be any increase in the past years. Girls dominated with 30 cases, giving a sex ratio of 6:1. The youngest patient was a 6-year-old boy, while 13 of the girls and 4 of the boys were in the age group 14–15 years (Table 2). All children were operated for primary diagnosed thyroid cancer; there were no occult carcinomas.

80% of cases were papillary and 2 girls had medullary tumours (Table 3). Anaplastic tumours did not occur in any of the cases. About half of the children had regional neck metastases, while 4 girls and 1 boy had distant metastases at the first hospital admission (Table 4). All patients were treated surgically, 26

Table 1. Number of cases in the period 1953–1987

	Period							
	53–59	60–64	65–69	70–74	75–79	80–84	85–87	Total
Boys	1	0	0	2	0	2	0	5
Girls	4	3	4	3	6	5	5	30
Total	5	3	4	5	6	7	5	35

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Table 2. Number of cases grouped according to age

	Age (years)				
	0–6	7–9	10–13	14–15	Total
Boys	1	0	0	4	5
Girls	0	3	14	13	30
Total	1	3	14	17	35

Table 3. Distribution of histological types

	Papillary	Follicular	Medullary	Total
Boys	4	1	0	5
Girls	25	3	2	30
Total	29	4	2	35

Table 4. Distribution of stages

	Stage 1	Stage 2	Stage 3	Total
Boys	2	2	1	5
Girls	11	15	4	30
Total	13	17	5	35

with total thyroidectomy and total neck dissection. 9 children were treated with hemithyroidectomy without neck dissection.

Relapses in the neck region were common. 12 patients had this experience from 1 to 28 years after initial diagnoses. The local relapses were treated surgically. Only 2 deaths were observed up to 1 June 1991. Both were papillary tumours diagnosed with extensive lung metastases. One girl being 14 years old at initial diagnosis of thyroid cancer, developed breast cancer at an age of 25 years. This is the only secondary cancer so far.

DISCUSSION

Thyroid cancer has a peak in incidence rate at about 40 years of age for women [1], with a new increase in elderly over 70 years. The present report indicates that thyroid cancers, diagnosed in children have the same histological and clinical characteristics as the adult form. The sex-ratio (6:1) is striking, but this rather unusual difference in the genders has been pointed out by several other authors [6, 8, 9].

Our previous incidence studies have revealed a female predominance (3:1) until about 55 years of age, slightly decreasing in the elderly (2:1) population [2].

Two other findings are also of interest. About 70% of the children had tumour growth outside the thyroid gland. This is in keeping with several other studies [6, 8–10]. In this respect, thyroid cancer in childhood differs from the adult type. The prognosis is, however, rather good [11–13].

In addition the number of relapses are high, without any major impact on prognoses. In fact 1 patient had proven lung metastases 8 years after initial diagnoses. She was treated with iodine 131 and has been reported healthy 15 years after the initial diagnosis.

The present report confirms our earlier published observations on age and prognoses [2]. The figures are small, but these children have, in spite of their regional metastases and relapses, a better prognoses than young adults under the age of 40.

It is also worth noting that the papillary type constitute about 80% of the material, which is even higher than for adults. Anaplastic types could not be found, while four follicular and two medullary tumours occurred.

Most children were treated with total thyroidectomy with neck dissection. The high number of regional metastases and relapses indicates that this should be the treatment of choice. Others have stated that this should be followed by adequate radio iodine therapy and suppressive treatment [10].

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