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THE INCIDENCE OF IODINE DEFICIENCY, HYPO- AND HYPER-THYROIDISM IN A SAMPLE OF PATIENTS INVESTIGATED AT THE NUCLEAR MEDICINE UNIT, PERADENIYA

by

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SUMMARY. Of 11,334 subjects investigated for thyroid disorders during a two year period 2.6% were euthyroid, 81.9% suffered from iodine deficiency, 9.0% were hypo-thyroid and 6.4% were hyper-thyroid. Iodine deficiency was diagnosed in the age range 14-70 years, hyper-thyroidism in the range 22-70 years and hypo-thyroidism in the entire range, infancy to 70 years. The female to male ratio was about 6:1 for iodine deficiency and about 3:1 for both hypo— and hyper-thyroidism.

INTRODUCTION

Since the establishment of a Nuclear Medcine Unit at the Faculty of Medicine, Peradeniya in 1972, more than 15,000 subjects have been referred to the Unit for investigation of thyroid disorders. There was evidence of iodine deficiency in majority of the subjects. This is a report of an analysis of patients referred to the Unit during a two year period ending 31st December 1988.

SUBJECTS AND METHODS

Patients from distant places are sent to the Unit only when *in-vivo* studies (iodine uptake and thyroid scans) have to be performed. Samples of serum from other patients are sent for assay of T3, T4 and TSH. On the average about 50 patients attend the thyroid clinic and about 80 samples of serum are received, each week. Between 1st January 1987 and 31st December 1988 a total of 11,334 patients have been investigated.

Taking into consideration the clinical history and the normal ranges for 2 and 24 hour iodine uptake and for serum T3, T4 and TSH established at the Unit, these subjects have been categorised as being iodine-deficient, hypo-thyroid and hyper-thyroid. The mean and standard deviation of the five criteria have been calculated for each category of subject.

RESULTS AND DISCUSSION

Table 1 shows the distribution of the subjects in the 9 provinces in the country. As is to be expected the largest number attending the clinic have been from the central province. The values for the five criteria used in categorising the subjects as euthyroid. iodine deficient, hypo - or hyper-thyroid are shown in Table 2.

TABLE 1. Number of patients with suspected thyroid disorders investigated at Nuclear Medicine Unit, Peradeniya, from 1st January 1987 to 31 st December 1988 from each province

	No. of patients attended	No. of blood samples	Total
Northern	12	494	506
North Central	252	570	822
North Western	287	581	868
Central	2109	1068	3177
Eastern	94	54	148
Sabaragamuwa	260	481	741
Uva	147	200	347
Western	607	3534	4141
Southern	65	519	584
Total	3833	7501	11334

TABLE 2. The values for the five criteria used in categorsing the subjects as Euthyroid, Iodine Deficient, Hypo-and Hyper-thyroid

	Euthyroid	Iodine Deficiency	Hypo-thyroid	Hyper-thyroid
2 hr. Uptake% [mean ± S.D.]	14 ± 5	> 20	8 ± 8	> 25
24 hr. Uptake % [mean ± S.D.]	45 ± 12	> 55	20 ± 12	> 65
T3 ng/100ml [mean ± S.D.]	100 ± 30	100 ± 30	< 80	> 200
T4 μg/100 ml [mean ± S.D.]	8 ± 2	8 ± 2	< 5	> 14
TSH mu/l [mean ± S.D.]	2.0 ± 1.6	2.0 ± 1.6	> 6	< 0.6

Table 3 indicates the number of subjects by sex falling into each of these categories, and Table 4 the mean and standard deviations of the 2 and 24 hour iodine uptake, and of serum T3, T4 and TSH of the subjects in each category.

TABLE 3. Number of subjects diagnosed as Euthyroid, Iodine Deficient, Hypo-and Hyper-thyroid

	Males	Females	Total
Euthyroid	43	257	300
Iodine Deficient	7957	1326	9283
Hyperthyroid	243	777	1020
Hypothyroid	186	545	731

TABLE 4. The mean and S.D. obtained for thyroid function tests in different categories of thyroid disorders (number of subjects investigated is given within brackets)

	Iodine Deficiency	Hypothyroid	Hyperthyroid
2 hr Uptake%	29 ± 16 [125]	11 ± 8 [21]	65 ± 17 [42]
24 hr Uptake%	65 ± 12 [125]	18 ± 13 [21]	72 ± 14 [42]
T3 ng/100 ml	104 ± 30 [3282]	41 ± 32 [311]	386 ± 99 [210]
T4 μg/100 ml	7.8 ± 1.8 [9283]	2.5 ± 2.0 [1020]	19 ± 7 [731]
TSH mu/l	1.8 ± 1.3 [75]	55 ± 13 [73]	0.41 ± 0.20 [82]

Of the 11,334 subjects investigated, 300 (2.6%) were euthyroid, 9283 (81.9%) were found to suffer from iodine deficiency, 1020 (9.0%) were diagnosed as being hypo-thyroid and 731 (6.4%) as hyper-thyroid. The female to male ratio of iodine deficiency was about 6.1 whereas the ratio for both hypo-and hyper-thyroidism was about 3:1 (Table 3). Iodine deficiency was noticed in the age range 14—70 years and hyperthyroidism in the range 22—70 years. Hypo-thyroidism was diagnosed in infants as well as in those 70 years old (Table 5).

TABLE 5. Percentage of Hypothyroid, Hyperthyroid and Iodine Deficient subjects in each age group

	Up to 1 yr	1—5 yr	5—10 yr	10—20 yr	> 20 yr
Hypothyroid	9.6%	5.5%	4.3%	6.6%	74%
Hyperthyroid	—	—	—	6.2%	93.8%
Iodine Deficiency	1.8%	1.8%	3.6%	18.2%	74.6%

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