

The Supplementary Role of each the Three Diagnostic Procedures: Invivo and Invitro Radioisotope Studies and Ultrasonography in a Combined Tripartite Study for a Proper Differential Diagnosis in Thyroid Enlargements

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INTRODUCTION

Enlargement of the thyroid may be diagnosed on the following data:

- Palpatory
- Clinical data
- Functional data, based on invitro and invivo radioisotope investigation.

Functional firm diagnosis is only possible from therapeutical deduction and histological findings by biopsy of post mortems.

Ultrasonography will enable closer approach to this final requirement of diagnosis without the necessity of biopsy and post mortems which usually (in Indonesia) is unpracticable or waiting for therapeutical result.

This paper is meant to make an overall review of the role of the various diagnostic procedures in establishing as firm as possible diagnosis of strumata of the thyroid, in particular illustrating the tripartite corroborative role of invivo, invitro radioisotope studies and ultrasonography.

CASES UNDER STUDY

During the period of September 2, 1982 – August 27, 1983 in the department of Nuclear Medicine and Ultrasonography of the Pertamina Central Hospital, Jakarta, 1323 patients were admitted with various clinical diagnosis, based on clinical symptomatology, palpatory findings and R.I.A results.

Of the 1323 admitted cases:

320 patients were male (24.2%)

1003 patients were female (75.8%)

In this department the patients were investigated by invivo and invitro radioisotope procedure

and ultrasonography.

The following criterias were established for the various classification of diseases.

Table 1. Category I: Basedow's Disease.

1. Number of cases studied						
Number	:	185 patients	.....	14% of total number of cases		
Females	:	62 patients	.....	33.5% of this category		
Males	:	123 patients	.....	66.5% of this category		
2. Laboratory findings						
			m	SD	n	units
T3	:	9.89	±	6.46	(185)	n mol/L
T4	:	292.35	±	132.1	(185)	n mol/L
TSH	:	11.56	±	9.57	(185)	p mol/L
Uptake 4 hrs	:	44.30%	±	19.49	(185)	
Uptake 24 hrs	:	59.49%	±	20.49	(185)	

Table II. Category II: Thyroiditis.

1. Number of cases studied						
Number	:	40 patients	.....	3% of total number of cases		
Females	:	12 patients	.....	30% of this category		
Males	:	28 patients	.....	70% of this category		
2. Laboratory findings						
			m	SD	n	units
T3	:	2.03	±	1.29	(40)	n mol/L
T4	:	112	±	69.12	(40)	n mol/L
TSH	:	17.86	±	19.9	(40)	p mol/L
Uptake 4 hrs	:	4.9%	±	2.6	(39)	
Uptake 24 hrs	:	12.8%	±	8.6	(40)	

I. The criteria for Morbus Basedow's.

(Graves') disease was established on:

- Clinical findings (hyperthyroidism) with or without exophthalmus.
- T3, T4 elevated which was not accompanied by relevant change of TSH.
- Invitro study : "Iodine uptake" is high and diffuse scintigram.
- Ultrasonography: showing diffuse enlarged thyroid parenchyme and occasionally vacuolization of colloid.

Table III. Category III: Cold Nodule Type of Goiter.

1. Number of cases studied

Number	: 212 patients	.....	16% of total number of cases	
Females	: 48 patients	.....	22.6% of this category	
Males	: 164 patients	.....	77.4% of this category	

1.1 Location :

Right lobe	: 136 patients	.....	64.2% of this	
Left lobe	: 76 patients	.....	35.8% category-III	

1.2 Ultrasonography findings :

56 are found as massive cold nodules (26.4%) of which 13 (23.2%) males and 43 (76.8%) females, with the localization :

massive cold nodule of the right lobe	36 cases	.....	64.3%	
massive cold nodule of the left lobe	20 cases	.....	35.7%	

Out of 212 cases of solitary cold nodule, 156 are found of the liquid type.
40 of which have the characteristic of thyroiditis (18.9% of solitary cold nodule).

2. Laboratory findings :

	m		SD	n	units
T3	: 1.94	±	0.72	(207)	n mol/L
T4	: 109.26	±	28.91	(207)	n mol/L
TSH	: 16.51	±	13.98	(203)	p mol/L
Uptake 4 hrs	: 9.52%	±	6.5	(193)	
Uptake 24 hrs	: 22.9%	±	13.04	(196)	

II. Thyroiditis

- Clinical findings: diffuse or nodulus enlargement showing the usual inflammatory signs.
- Functional laboratory findings:
 - . T3, T4 elevated and TSH decreased in acute stages. T3, T4 normal or slightly decreased while TSH elevated in sub-chronic or chronic type (potential hypothyroidy).
 - . Iodine uptake decreased.
 - . Scintigraphy non fixative to hypofixative.
 - . Ultrasonography: diffuse with low echogenity or liquid appearance in nodulus type.

In cases of hot nodule but no suppressed tissue is shown outside the nodule by stimulation test, we may conclude hot nodule being compensatory active tissue in congenital hypogenesis.

Table IV. Category IV: Hot Nodule Type.

1.	Number of cases studied :						
	Number	:	30 patients	.....	2.3%	of total number of cases
	Females	:	2 patients	.....	6.7%	of this category
	Males	:	28 patients	.....	93.3%	of this category
1.1	Location :						
	right lobe	:	17 patients	.....	56.7%	
	left lobe	:	13 patients	.....	43.3%	
2.	Laboratory findings :						
			m		SD	n	units
	T3	:	2.35	±	0.92	(30)	n mol/L
	T4	:	138.84	±	56.25	(30)	n mol/L
	TSH	:	12.96	±	9.9	(30)	p mol/L
	Uptake 4 hrs	:	15%	±	9.9	(30)	
	Uptake 24 hrs	:	28%	±	21.9	(30)	

III. Cold nodule type of enlargement (Ref. Dr. Soegandha Prawiraatmadja paper).

- Palpatory findings include solitary nodule with no clinical signs.
- Scintigraphy: cold nodule in radioisotope scintigraphy.
- Invitro studies: T3, T4, TSH not typical.
- Ultrasonography:
 1. Massive diffuse or massive with calcification:
 - diameter less than 1.5 cm
 - wait and see
 - over 1.5 cm
 - malignancy probable : Surgical removal for excluding malignancy adviseable
 2. Liquid type:
 - pure liquid
 - liquid + debris
 - problem thyroiditis
 - cyst with sharp circumscribed border
 - very low probability of malignancy

IV. Hot Nodule

- Scintigraphy : Hyperfixative or normofixative.
- Invitro : T3, T4 may be elevated with low TSH (hyper-thyroidy) or T3, T4 normal.
- Ultrasonography : Usually the nodule massive with echostructure almost normal and encapsulated. At the site of the normal thyroid, the ultrasonography showed almost normal tissue though in scintigraphy this part is non or hypofixative.
 - Most probable suppressed by the outonomous functioning nodule. This can be confirmed by TSH stimulation test.
 - Toxic Adenoma.

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