

## Pemeriksaan TSH-sensitif sebagai uji saring hipertiroidisme = Sensitive TSH assay as a screening test for hyperthyroidism

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### Abstrak

#### <b>ABSTRAK</b>

Dalam upaya penatalaksanaan penderita penyakit kelenjar tiroid, harus dibuat diagnosis anatomik atau etiologik untuk mengetahui penyebab yang mendasari penyakit dan diagnosis fungsional untuk mengetahui status produksi hormon tiroid. Pemeriksaan laboratorium sangat berguna dalam membedakan fungsi kelenjar tiroid tersebut termasuk hipotiroid, eutiroid atau hipertiroid.

Penelitian ini bertujuan untuk mengetahui apakah pemeriksaan TSH-sensitif metode IRMA dan ICMA dapat membedakan dengan jelas penderita hipertiroidisme dan kontrol eutiroid, dengan kata lain apakah pemeriksaan tersebut dapat dipakai sebagai uji saring untuk hipertiroidisme. Disamping itu ingin mendapatkan nilai rujukan TSH-IRMA dan ICMA yang dapat dipakai di UPF Patologi Klinik FKUI/RSCM.

Subyek penelitian adalah 35 penderita hipertiroidisme, terdiri atas 25 orang wanita dan 10 orang laki-laki, berusia 21-59 {30,2) tahun. Sebagai kontrol adalah 70 orang yang mempunyai fungsi kelenjar tiroid eutiroid, terdiri atas 40 laki-laki dan 29 perempuan, berusia 15-73 (37) tahun. Kriteria diagnostik didasarkan pada temuan klinik dan hasil pemeriksaan laboratorium FT4I. Terhadap subyek penelitian dan kontrol dilakukan pemeriksaan T4 total, T3U, TSH-IRMA (DPC) dan TSH-ICMA (Amerlite).

Hasil pemeriksaan kontrol: T4=4,1-15,1 (9,28) ug/dL; T3U = 19,3-33,0 (27,3)%; FT4I=0,81-3,59 (2,53); TSH-IRMA=0,25-3,60 (1,38) mIU/L dan TSH-ICMA=0,54-3,12 (1,34) mIU/L. Terdapat korelasi terbalik antara nilai T4 total, T3U dan FT4I dengan TSH-IRMA maupun TSH-ICMA. Tidak terdapat perbedaan nilai TSH kontrol laki-laki dan perempuan. Tidak terdapat hubungan antara umur dan nilai TSH. Nilai rujukan TSH-IRMA = 0,39-3,63 mIU/L, dan TSH-ICMA = 0,49-2,97 mIU/L. Hasil pemeriksaan penderita hipertiroid: T4 = 16,0->24 ng/dL; T3U=30,3-43,7 (38,3)%; FT4I = 5,36->10,49; 31 (88,51.) orang mempunyai nilai TSH-IRMA dan ICMA tidak terukur dan, 4 Orang mempunyai nilai TSH-IRMA 0,09; 0,12; 0,16; 0,18 dan TSH-ICMA 0,06; 0,12; 0,13; 0,14. Nilai TSH-IRMA dan TSH-ICMA penderita hipertiroid berbeda bermakna dengan kontrol eutiroid. Terdapat korelasi antara nilai TSH-IRMA dengan TSH-ICMA ( $r = 0,9922$ ). Nilai TSH-ICMA lebih rendah 6,6% dibanding TSH-IRMA. Nilai batas deteksi TSH-IRMA = 0,09 mIU/L dan TSH-ICMA = 0,04 mIU/L. Biaya per tes TSH-IRMA lebih mahal dibanding TSH-ICMA, karena pemeriksaan TSH-IRMA harus dilakukan in duplo. Pemeriksaan TSH-IRMA dan TSH-ICMA sensitif secara analitik dan klinik untuk diagnosis hipertiroidisme.

Kesimpulan penelitian ialah pemeriksaan TSH-IRMA dan TSH-ICMA mampu membedakan dengan jelas penderita hipertiroidisme dan kontrol eutiroid, dan dapat dipakai sebagai uji saring hipertiroidisme. Batas deteksi pemeriksaan TSH-ICMA lebih rendah dari pada TSH-IRMA. Nilai rujukan

TSH-IRMA berbeda dengan TSH-ICMA.

Disarankan untuk melakukan penelitian serupa dengan subyek penelitian dan kontrol (penderita rawat tinggal dan rawat jalan) yang lebih banyak agar dapat ditentukan nilai batas TSH untuk diagnosis hipertiroidisme, dan mendapatkan nilai rujukan yang lebih memenuhi syarat. Disarankan pula untuk menilai kemampuan pemeriksaan TSH untuk memantau pengobatan hipertiroidisme dan pengobatan hormon tiroid.

*In managing patients with thyroid diseases, an anatomical or etiological diagnosis should be made for knowing the basic causes, and functional diagnosis for knowing the thyroid hormone production. Laboratory tests are necessary to differentiate whether the condition is hypothyroid, euthyroid or hyperthyroid.*

The goal of this study was to know whether TSH-IRMA and ICMA tests can clearly differentiate hyperthyroid patients from euthyroid, and whether this test can be used as the first test for hyperthyroidism. More over, to determine the reference range of TSH-IRMA and ICMA which can be used in the Departement of Clinical Pathology, Dr Cipto Mangunkusumo hospital / Faculty of Medicine University of Indonesia.

The subjects of this study were 35 patients with hyperthyroidism. They consist of 25 women and 10 men, who were 21-59 (30,2) years old. We took 70 people who were in euthyroid condition, about 15-73 (37) years old as controls. The criteria of diagnosis were based on clinical finding and FT4I test. Subjects and controls were examined for total T4, T3U, TSH-IRMA (DPC) and TSH-ICMA (Amerlite) levels.

Values of the controls were T4 = 4,1-15,1 (9,28) ug/dL; T3U = 19,3-33,0 (27,3)%; FT4I = 0,81-3,59 (2,53); TSH-IRMA = 0,25-3,60 (1,3B) mIU/L and TSH-ICMA = 0,54-3,12 (1,34) mIU/L. There was negative correlation between total T4, T3U or FT4I level and TSH-IRMA or TSH-ICMA. There was no difference between TSH level in male and female controls. No correlation was found between age and TSH level. The reference value of TSH-IRMA was 0,39-3,63 mIU/L and TSH-ICMA was 0,49-2,97 mIU/L.

The level of total T4, T3U and FT4I in hyperthyroid were 16,0->24 ng/dL, 30,3-43,7 (38,3)7 and 5,36-7.10,49 respectively. TSH-IRMA and TSH-ICMA value were undetectable in 31(88,5%) persons, and 4 persons have TSH-IRMA level of 0,09; 0,12; 0,16; 0,1B and TSH-ICMA level of 0,06; 0,12; 0,13; 0,14. TSH-IRMA and TSH-ICMA level in hyperthyroid were significantly lower than in euthyroid.

There was a good correlation between TSH-IRMA and TSH-ICMA ( $r = 0,9922$ ). TSH-ICMA was 6,6% lower than TSH-IRMA. The detection limit of TSH-IRMA was 0,09 mIU/L and TSH-ICMA was 0,04 mIU/L. One TSH-IRMA test was more expensive than one TSH-ICMA test, because TSH-IRMA test must be performed in duplicate. TSH-IRMA and TSH-ICMA assays were analytically and clinically sensitive and specific for diagnosing hyperthyroidism.

In conclusion, TSH-IRMA and TSH-ICMA assays could clearly differentiate hyperthyroid from euthyroid patients, and suitable as screening tests for hyperthyroidism. The detection limit of TSH-ICMA was lower than TSH-IRMA. The reference range of TSH-IRMA was different from TSH-ICMA.

Further study with more subjects is still needed to determine TSH lower limit value for diagnosing hyperthyroidism and a more acceptable reference value. We suggest another study to evaluate TSH values in controlling treatment of hyperthyroidism and thyroid hormones supplementation.</i>