

นิพนธ์ต้นฉบับ

Original Article

Thyroid Function Tests References Parameters ค่าอ้างอิงสำหรับการตรวจต่อมไทรอยด์ทางเคมีคลินิก

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ABSTRACT

Objective : To set up new thyroid function tests references parameters among the Thais in Bangkok

Study Design : A descriptive study

Subjects : 100 normal subjects of both sexes attending the routine check up program of King Chulalongkorn Memorial Hospital

Method : Blood specimen from each subject was collected using the evacuated blood collection system. Then 5 important clinical chemistry parameters including T3, T4, FT3, FT4 and TSH were analyzed using automated clinical chemistry analyzer. Then reference ranges were calculated.

Results : The reference values of each parameter were set and described in the article.

Conclusion : Reference value setting is necessary and should be found in each laboratory setting.

Key words : thyroid function test, reference

บทคัดย่อ

วัตถุประสงค์ : ทำการศึกษาค่าอ้างอิงสำหรับการตรวจต่อมไทรอยด์ทางเคมีคลินิกในกลุ่มคนไทยในกรุงเทพมหานคร

รูปแบบการศึกษา : การศึกษาเชิงพรรณนา

ตัวอย่างที่ทำการศึกษา : ตัวอย่างชาวกรุงเทพฯ จำนวน 100 คน ที่ได้รับการตรวจสุขภาพจากโรงพยาบาลจุฬาลงกรณ์

วิธีการศึกษา : ทำการเก็บตัวอย่างเลือดจากตัวอย่างแต่ละคน แล้วนำมาวิเคราะห์ทางเคมีคลินิกด้วยเครื่องวิเคราะห์อัตโนมัติเพื่อหาระดับสารเคมีที่สำคัญ 5 ชนิดคือ T3, T4, FT3, FT4 และ TSH นำผลที่ได้มาคำนวณหาค่าอ้างอิงต่อไป

ผลการศึกษา : ได้ค่าอ้างอิงสำหรับสารเคมีแต่ละชนิดและแสดงไว้ในรายงาน
บทสรุป : การหาค่าอ้างอิงเป็นสิ่งที่มีความจำเป็นและควรจัดทำในห้องปฏิบัติการทางการแพทย์ทุกแห่ง
คำสำคัญ : การตรวจต่อมไทรอยด์ทางเคมีคลินิก, ค่าอ้างอิง

Thyroid function tests are common laboratory requests in the present day.¹⁻² Considering the pathogenesis of many thyroid diseases, before the clinical symptoms can be detected, the abnormalities in laboratory result can be detected.³

In interpretation of thyroid function tests, reference ranges of the tests are necessary.³⁻⁴ Due to the fact that the reference values of each laboratory test vary on geographical distribution, it is necessary to set the laboratory reference ranges according to each area. From literature review, there are only a few reports of the reference ranges among the Thai and there is no recent report detected. In this study, the thyroid function test reference ranges among the Thai in Bangkok are set.

Material and method

This study was set as a descriptive study. A total number of 100 normal subjects of both sexes attending the routine check up program of King Chulalongkorn Memorial Hospital were included in this study. Exclusion was set in the case of any abnormalities detected by the physician during physical examination.

Blood specimen from each subject was collected using the evacuated blood collection system. The studied clinical chemistry tests parameters consisted of triiodothyronine (T3), thyroxine

(T4), free triiodothyronine (FT3), free thyroxine (FT4) and thyroid stimulating hormone (TSH). Each blood test was radioimmunoassay tested by automated chemistry analyzer.

The result from each subject was recorded in tabular form. Then all results were collected and analyzed. Each parameter was calculated for the average and standard deviation (SD). The reference range for each parameter was set at average \pm 2 SD.⁵

Result

The average, standard deviation and reference ranges for each parameter were shown in table 1.

Discussion

Reference values determination for each setting is important due to the variability of normal values in each area. In this study, reference values for thyroid function tests parameters for the Thai in Bangkok were set. This present reference values is automated-derived which is the most frequent used technique. While the old reference values in use of many laboratories are manual-derived and obtained from the manufacturer's recommendation.

Comparing our reference values to the general reference values, the similarity can be observed. The studied parameters in this report are the

Table 1. Average, standard deviation and reference range for each parameter.

Parameters	Average	Standard deviation	Reference range
T3 (nmol/l)	2.1	0.45	1.2-3.0
T4 (nmol/l)	119.6	27.38	64.8-174.3
FT3 (pmol/l)	5.8	0.80	4.2-7.4
FT4 (pmol/l)	18.0	3.20	11.6-24.4
TSH (U/l)	2.2	0.98	0.2-4.1

common clinical tests, which are usually included in the thyroid check up. Therefore, it can be a useful tool for the physician in interpretation of the patient's laboratory results.

The author recommends every laboratory for calculation of their own reference values. It is one of the concepts for standardization of the laboratory setting.⁶⁻⁷ In Thailand, this type of study is limited, therefore, it should be promoted. Furthermore, finding the reference values among specific patient groups such as pregnant, infant, children and elderly is suggested.

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