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Abstract

It is evident that, in the last years there is an increase incidence of thyroid disorders in Sudanese people. This study was conducted essentially to know the effects of age, sex and residence on the incidence of thyroid disorders, and to know the influence of iodine status of a subject on thyroid function by measuring urinary iodine concentration.

A total of 100 Sudanese patients, with thyroid disorders visiting the Radiation and Isotope Centre (RICK) at Khartoum, during the period of February 2005 to July 2005, were selected randomly to contribute in this study. A total of 30 healthy subjects from the co-patients were volunteered to participate in this study as a control group. Specimens of sera and urine samples were collected from all patients and controls to estimate thyroid hormones, T3 & T4 by (RIA) method and TSH by (IRMA) method.

Urine samples were used to measure urinary iodine concentration by Sandle Koltholt Reaction (using ammonium persulfate as a catalyst).

The patients were categorized as hyperthyroidism and hypothyroidism. There is an increased incidence of hyperthyroidism in the middle aged patients, while hypothyroidism is more common in the elderly, the results were found to be as follows:

- In the hyperthyroidism (n=80): there were 16 patients (20%) of age < 20 years, 43 patients (53.3%) aged between 20-40 years, and 21 patients (26.2%) of age > 40 years.
- In hypothyroidism (n=20): there were 2 patients (10%) of age < 20 years, 6 patients (30%) aged between 20-40 years and 12 patients (60%) of age > 40 years.

Females were more susceptible to thyroid disorders than males for both hyperthyroid and hypothyroidism:
- In hyperthyroidism females were 65 out of 80 (81.3%).
- In hypothyroidism females were 14 out of 20 (70%).

The disease was found to be distributed in all regions of Sudan, with increased incidence of hyperthyroidism in Central-Sudan (Khartoum State & Gazera area) (47.5%), North (18.8%), East (5%), West (13.7%) and South (5%) while for hypothyroidism there was increased incidence in the West (45%), Central-Sudan (26%), North (25%), East (5%), South (0%).

In this study, urinary iodine concentration was found to be highly significantly raised in patients with hyperthyroidism compared to the control (P<0.01), while highly significantly reduced in patients with hypothyroidism (P<0.01).

From this study it is recommended that urinary iodine could be used as a screening and diagnostic test for both hyper and hypothyroidism.
ملخص البحث
تلاحظ أن هناك ازديادًا ضروريًا في اختلال نشاط الغدة الدرقية لدى السودانيين من حيث زيادة أو انخفاض في نشاط الغدة. وقد أجريت هذه الدراسة أساسا لمعرفة مدى تأثير العمر، الجنس، مكان السكن الأصلي للفرد على نشاط الغدة الدرقية، مع قياس نسبة اليود لدى الفرد ومعرفة مدى تأثيره على وظائف الغدة الدرقية وذلك بقياس نسبة تركيز اليود في البول.

تم اختيار مجموعة 100 مريض مصاب باختلال نشاط الغدة الدرقية، منهم 80 مريضا مصاب بفرط نشاط الغدة الدرقية و 20 مريضا مصاب بانخفاض نشاط الغدة، إضافة إلى 30 متطوعا لا يعانون من أي مرض كعينة مرجعية للمقارنة.

وقد شملت الفحوصات كل المجموعات (130) شخص حيث تم قياس التأثيرات ثلاثية اليود و رباعي اليود (RIA) و قياس محفز الغدة الدرقية (T3, T4) عن طريق تفاعلا بين اليود وبوتاسيوم. اما نسبة تركيز اليود في البول وقياس تركيز اليود في البول وقياس تركيز اليود في البول وقياس تركيز اليود في البول.

وقد خلصت الدراسة بأن اعلى نسبة من المرضى المصابين بفرط نشاط الغدة الدرقية تتراوح اعمارهم ما بين 20 و 40 سنة (43 مريضا من بين 80 مريضا بنسبة 53.3%). أما بالنسبة من المرضى المصابين بانخفاض نشاط الغدة الدرقية اعمارهم أكثر من 40 سنة (12 مريضا من بين 20 مريضا بنسبة 60%). ان النساء أكثر عرضة للاصابة باختلال الغدة الدرقية حيث هناك 65 امرأة من بين 80 مصابا بازدياد نشاط الغدة (نسبة 81.3%) و 14 امرأة من بين 20 مصابا بانخفاض نشاط الغدة (نسبة 70%).

كذلك تلاحظ بأن اعلى نسبة من المرضى المصابين بازدياد نشاط الغدة الدرقية يقطنون وسط السودان (ولاية الخرطوم + ولاية الجزيرة) بنسبة 47.5% و ان اعلى نسبة من المصابين بانخفاض الغدة الدرقية يقطنون غرب السودان بنسبة 45%.

تذكر أن هذه الدراسة بان هناك ارتباط قوي بين مستوى تركيز اليود في البول و اختلال نشاط الغدة الدرقية زيادة كأن نقصًا باحتمال احصائي ( 0.01)، وهذا يمكننا من أن نستخدم قياس مستوى تركيز اليود في البول لمعرفة نشاط الغدة الدرقية ازديادًا أو نقصًا.
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# ABBREVIATIONS

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<tr>
<td>ACTH</td>
<td>Adrenocorticotrophin hormone</td>
</tr>
<tr>
<td>ANS</td>
<td>Aniline-1- naphthalene sulfonic acid</td>
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<tr>
<td>BMR</td>
<td>Basal metabolic rate</td>
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<tr>
<td>Ca++</td>
<td>Calcium</td>
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<tr>
<td>DIT</td>
<td>Dilodotyrosine</td>
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<tr>
<td>FSH</td>
<td>Follicle stimulating hormone</td>
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<td>GFR</td>
<td>Glomerular filtration rate</td>
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<td>I2</td>
<td>Iodine</td>
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<tr>
<td>ICCID</td>
<td>International Council for the Control of Iodine Deficiency</td>
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<tr>
<td>IDD</td>
<td>Iodine deficiency disorders</td>
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<tr>
<td>IH</td>
<td>Inhibitory hormone</td>
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<td>IP</td>
<td>Iodine pump</td>
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<tr>
<td>IR</td>
<td>Endoplasmic reticulum</td>
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<td>IRMA</td>
<td>Immunoradiometric assay</td>
</tr>
<tr>
<td>LDL</td>
<td>Low-density lipoprotein</td>
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<tr>
<td>LH</td>
<td>Leutinizing hormone</td>
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<tr>
<td>Mc</td>
<td>Monoclonal</td>
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<tr>
<td>MIT</td>
<td>Monoiodotyrosine</td>
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<tr>
<td>NSB</td>
<td>Non-specific binding</td>
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<tr>
<td>PBI</td>
<td>Protein bound iodine</td>
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<tr>
<td>Pc</td>
<td>Polyclonal</td>
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<tr>
<td>RH</td>
<td>Releasing hormone</td>
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</table>
rT3  Reverse T₃
T₃  Tri-iodothyronin
T₄  Thyroxin (tetraiodothyronin)
TBA  Thyroxin-binding albumin
TBG  Thyroxin-binding globulin
TBPA  Thyroxin-binding prealbumin
TRH  Thyrotrophin releasing hormone
TSH  Thyroid stimulating hormone (thyrotrophin)
U.S.A  United State of America
UNICEF  United Nation International Children Education Fund
WHO  World Health Organization