ACKNOWLEDGEMENTS

I would like to express my sincere thanks and gratitude to my supervisor Dr. Badr Eldine Hassan Elabid for his close supervision, encouragement and sustained support.

I wish to emphasize my heartily thanks to Dr. Mohamed Abdel Rahim, Head department of Biochemistry, Faculty of Science, Sudan University of Science and technology, for his advice, and follow up as a co-ordinator of the MSc program in clinical biochemistry.

My thanks and appreciation to (AlFatih, Najwa) the Technical Staff of the Radiation and Isotopes Centre (RICK) Khartoum, for collaboration and assistance in this work.

Thanks are extended to all patients and controls who donate me the samples.

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, T_3 & T_4 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 ان هنالك ازدياداً مضطرداً فى اختلال نشاط الغدة الدرقية لدى السودانيين من حيث زيادة او انخفاض فى نشاط الغدة. و قد اجريت هذه الدراسة اساسا لمعرفة مدى تأثير العمر ، الجنس ، مكان السكن الاصلى للفرد على نشاط الغدة الدرقية، مع قياس نسبة اليود لدى الفرد و معرفة مدى تأثيره على وظائف الغدة الدرقية و ذلك بقياس نسبة تركيز اليود فى البول.

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

و قد شملت الفحوصات كل المجموعات (130) شخص حيث تم قياس الثايرونين ثلاثى اليود و رباعى اليود (T_3 , T_4) عن طريقة (RIA) و قياس محفز الغدة الدرقية (TSH) بطريقة (IRMA) اما نسبة تركيز اليود فى البول وقيست بطريقة تفاعل ساندل كوتولت Sandle Kottlot . و قد 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 مريض) بنسبة 53.3% . اما اعلى نسبة من المرضى المصابين بانخفاض نشاط الغدة الدرقية اعمارهم اكثر من 40 سنة (12 مريضاً من بين 20 مريضاً) بنسبة 60% . ان النساء اكثر عرضة للاصابة باختلال الغدة الدرقية حيث هنالك 65 امرأة من بين 80 مصابا بازدياد نشاط الغدة (بنسبة 81.3%) و 14 امرأة من بين 20 مصابا بانخفاض نشاط القدة (بنسبة 70%). كذلك تلاحظ بان 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%.

تلاحظ من هذه الدراسة بان هنالك ارتباطاً قوياً بين مستوى تركيز اليود فى البول و اختلال نشاط الغدة الدرقية زيادة كان ام نقصاناً باحتمال احصائى (0.01) ، و هذا يمكننا من ان نستخدم قياس مستوى تركيزاليود فى البول لمعرفة نشاط الغدة الدرقية ازدياداً او نقصاناً .

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ABBREVIATIONS

ACTH	Adrenocorticotrophin hormone
ANS	Aniline-1- naphthalene sulfonic acid
BMR	Basal metabolic rate
Ca^{++}	Calcium
DIT	Dilodotyrosine
FSH	Follicle stimulating hormone
GFR	Glomerular filteration rate
I_2	Iodine
ICCID	International Council for the Control of Iodine Deficiency
IDD	Iodine deficiency disorders
IH	Inhibitory hormone
IP	Iodine pump
IR	Endoplasmic reticulum
IRMA	Immunoradiometric assay
LDL	Low-density lipoprotein
LH	Leutinizing hormone
Mc	Monoclonal
MIT	Monoiodotyrosine
NSB	Non-specific binding
PBI	Protein bound iodine
Pc	Polyclonal
RH	Releasing hormone
RIA	Radioimmunoassay

rT3	Reverse T_3
T_3	Tri-iodothyronin
T_4	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
UNICIEF	United Nation International Children Education Fund
WHO	World Health Organization