



Urinary Iodine Excretion in Patients With Benign Goitres

KEYWORDS

Urinary Iodine ,Goitre, Sandell-Kolthoff reaction

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ABSTRACT Background

Patients with asymptomatic goitre is common in many areas of the world. Malabar region is the northern part of Kerala where we find ample number of patients with goitre. Even though iodine containing food materials are consumed by people living in these areas, goitre is a common problem

Aim

To study the excretion of iodine in urine in patients with benign goitres. Iodine excretion in urine is an indirect indicator of dietary intake of iodine

Methods

Assessment of the early morning urine iodine excretion which is a relatively constant factor. Urinary iodine excretion satisfactorily reflects the dietary intake

The Sandell-Kolthoff reaction {1} of arsenite reduction of coloured ceric ion (Ce)⁴⁺ to colourless cerous ion (Ce)³⁺ in the presence of iodine (as catalyst) is the most sensitive and commonly used method for iodine estimation

Assessment of the size of the thyroid gland by WHO classification. {2}

Introduction

Since most of the iodine that is absorbed is excreted in urine the urinary iodine is a good marker of the previous days dietary intake. However since an individual's level of urinary iodine varies daily and even during the day the data can be used reliably only for population based estimation of iodine intake.

The absence of iodine deficiency (median urine iodine >100 mg/dL) is associated with a goiter prevalence of less than 5%; mild iodine deficiency (median urine iodine 50-99 mg/dL), with a goiter prevalence of 5-20%; moderate iodine deficiency (median urine iodine 20-49 mg/dL), with a goiter prevalence of 20-30%; and severe iodine deficiency (median urine iodine <20 mg/dL), with a goiter prevalence of greater than 30%. {5}

There are lot of patients with goitres in northern part of Kerala. People are taking iodine containing food materials regularly. Fish and milk are consumed by most of the people living in this area. Majority are using iodised salt in the last 15-20 years. Still goitre is prevalent in Malabar area. This study is to know the iodine nutrition status and the goitres. Plenty of patients with thyroid diseases seeking medical and surgical help everyday. The reason for several types of thyroid diseases is exactly not known. Goitre is more common in females and its initiation is due to the high requirement of iodine during puberty and pregnancy. The incidence of further increase in size of the gland and structural changes developing in the thyroid gland are initiated during these two occasions during which the high demand of iodine is not met with.

Materials and methods

A hospital based prospective study was performed from the period September 2002 to June 2005. A total of 311 patients with proven benign goitres were included in the study. The source of data was patients attending our general surgery department in Calicut medical college who

fulfilled our inclusion and exclusion criteria. All of them underwent cytological assessment. Both males and females are included

The following methods are adopted for evaluation

1. Assessment of the early morning urine iodine excretion which is a relatively constant factor. Urinary iodine excretion satisfactorily reflects the dietary intake. {4}
2. Assessment of the size of the thyroid gland by WHO classification.

Urinary iodine excretion reflects current iodine concentrations, and goitre indicates a chronic situation of iodine deficiency. Therefore, the prevalence of Iodine Deficiency Disorders as determined by the two indicators does not necessarily need to be consistent {2}

Experience has shown that an early morning urine specimen (5ml) provides an adequate assessment of urinary iodine level. A 24 hour collection is not necessary. Results are normally expressed as µg/L of urine rather than per gram of creatinine {4}

WHO Classification of Thyroid Gland size {4}

Grade 0 Thyroid not palpable or if palpable the size is normal

Grade 1 Thyroid is enlarged and it is more than normal but unable to see with neck in the normal or extended position

Grade 2 Thyroid is easily palpable and able to see with extended neck. The existence of a nodule is included in this category

Grade 3 Thyroid is easily seen at normal head position

Grade 4 A monstrous goitre

Results

92% of the study population consumed only iodised salt for more than 10 yrs. 7 % of them consumed both iodised and other type of salts.1% used only non iodised salt. 96% of the study population were non vegetarians and 4% were vegetarians. In the nonvegetarian group, more than 95 % consumed fish at least 5/7 days .all patient population consumed milk and related products regularly.

Mean age of the patient population was 37.86. (SD 11.11) Mean T3 was 2.0247, T4 was 152.88. TSH was 2.4 (SD 3.76) and urinary iodine was 155.03. (SD 40.78) T3 level was slightly on the higher side. T4, TSH and urinary iodine were within normal range. Urinary iodine was 155.03, which was much more than that of average normal values. Mean age of the patient population was 37.86. (SD 11.11) Mean urinary iodine was 155.03. (SD 40.78).Median urinary iodine was 158

Gland size and Urinary Iodine:

WHO grade 2 gland size group had 7.7% with low urinary iodine and 92.3% had normal urinary iodine.Grade 3 gland size patients – the majority 89.9% had normal values, 10.1% had low values.Grade 4, 7.3% had low urinary iodine, whereas 92.7% had normal value

Gland Size and Urinary Iodine in Total Study Population:

Gland size and urinary iodine are compared here. Total 27 patients had low urinary iodine and 284 patients had normal urinary iodine.

Chi-Square Tests

No significant correlation was observed between urinary iodine excretion levels and thyroid volumes. This comparison does not show any statistical significance.

Discussion

Urinary excretion of Iodine and size of the goitre were assessed in this present study.91.3% of patients with different sizes of goitre had normal urinary Iodine excretion.8.7% had low urinary Iodine .So majority of the goitre patients are having adequate or normal Iodine excretion in urine.It indicates that the dietary intake of Iodine is adequate in 91.3% of patients .most of the patients consume mil,milk products and fish which are good sources of Iodine. 99% of patients consume Iodised salt. There is no comparative difference in the size of the gland and the urinary Iodine excretion status.

Conclusion

1. The study population are having urinary iodine median value of 158. Most of the population studies revealed a median value of 100 µgm / L of urinary Iodine indicates adequate intake of Iodine. Median urinary iodine concentrations of 100µg/L and above indicates a population which has no iodine deficiency. 91.3% of the study population showed normal urinary iodine which indicates that the dietary intake is adequate and they still have goitre. Concentration of Iodine in urine is the most important biochemical marker of iodine nutrition. Urinary iodine values assesses iodine nutrition only at the time of measurement. Size of the Thyroid gland reflects iodine nutrition over months or years. Goitre can be present in populations who have attained iodine sufficiency by median urinary iodine concentration,

References

1. Endemic goiter and cretinism,Iodine nutrition in health and disease. John B Stanbury MD Basil S Hetzel.Commonwealth scientific research organization

1. WHO, UNICEF and ICCIDD 2001 Assessment of the Iodine Deficiency Disorders and monitoring their elimination. A guide for programme managers. WHO publ., Geneva. WHO/NHD/01.1
2. Institute of Clinical Pathology and Medical Research Fact Sheet. www.icpmr.gov.au
3. Stephanie L Lee, MD, PhD, Sonia Ananthakrishnan, MD Goiter, Nontoxic eMedicine Specialties > Endocrinology > Thyroid Mar 22, 2010
1. Caroli spensor Ph.D.university of southern California.Thyroidmanager chapter 6a.thyroid function tests.Assay of Thyroid hormones and related substances.1january 2010