

Long-term universal salt iodization has resulted now in more than adequate iodine intake and consequent chronic autoimmune thyroiditis in school-age children living in some localities from Mures and Harghita Counties, Romania

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INTRODUCTION, OBJECTIVES

In Romania universal salt iodization was implemented into practice since 2002, and iodine content of salt was gradually increased afterward. The efficiency and sustainability of this nationwide program were evaluated among schoolchildren from endemic regions of Mures and Harghita Counties. During these studies thyroid ultrasound characteristics for chronic autoimmune thyroiditis were observed in a considerable number of cases.

Objective. To estimate the iodine status in schoolchildren living in some localities of the two counties; to detect cases with Hashimoto's thyroiditis.

MATERIAL AND METHODS

In 374 schoolchildren with age between 6 to 14 years physical exam, anthropometric evaluation, thyroid ultrasound, morning urinary iodine concentration (UIC), and in case of suggestive ultrasound appearance for thyroid autoimmunity the level of serum thyroid stimulating hormone (TSH), free-thyroxine (fT4) and anti-thyroid peroxidase antibodies (TPO-Ab) were assessed.

RESULTS

Iodine status estimated by mean and median UIC in schoolchildren living in rural localities from Mures County:

2005-2006: 85.4±60.0 µg/L and 74.9 µg/L - still a mild iodine deficiency,

2013-2014: 342 ± 197 µg/L and 298 µg/L - more than optimal iodine supply, even more an excessive iodine intake (values being above 300µg/L).

→ **P-value < 0.0001; RR=0.5846; 95%CI=0.5647-0.6052).**

UIC below the normal range (< 100 µg/L):

2005-2006: in 68.1%, the remaining 31.9% was in the normal range.

2013-2014: low UIC in only 3.33% of cases, normal values were in 60.84%, and **high or very high UIC in 41.4% of children.**

The frequency of high UIC in the two cohorts was significantly different, i.e. in the second period the percent cases with high UIC increased significantly compared the first period (P-value < 0.0001; RR=1.519; 95%CI=1.335-1.728).

The frequency of goiter based on ultrasound thyroid volumetry: 2005-2006: 20%, 2013-2014: 6.2% → significant reduction of the goiter frequency among schoolchildren living in Gurghiu-Valley (p=0.0038; RR=1.49; 95%CI=1.21-1.83).

The ultrasound aspect of goiters was usually isoechoic and homogeneous, without nodules or pseudonodules in the 20% of individuals during 2005-2006, but in 2013-2014 besides the 6.2% with goiter we observed **ultrasound picture suggestive for autoimmune processes without goiter in other 23.1% of children.** UIC was increased in all of these last cases except two. In two children anti-TPO-Ab positivity was detected.

In Harghita County a total number of 119 children were enrolled from Odorheiu-Secuiesc and Miercurea-Ciuc:

mean and median UIC: 248±127 µg/L and 215 µg/L - more than adequate iodine supply, moreover high or very high UICs being measured in 38.4% of cases.

UIC below 100 µg/L: in 5.8% of the children.

In Harghita County cohort thyroid US discovered goiter in 3% in Miercurea-Ciuc, and in no case in Odorheiu-Secuiesc. In contrary, **hypoechoic and/or inhomogeneous ultrasound picture of the thyroid gland was detected in 13.4%** from Harghita County; among these cases TPO-Ab was high in seven schoolchildren (43.75% out of hypoechoic/inhomogeneous thyroids). In all these cases overt or subclinical hypothyroidism was present at diagnosis, anthropometric evaluation showed a slightly slowed growth and delayed pubertal development.

CONCLUSION

The universal salt iodization program is efficient and sustained in Mures and Harghita Counties, moreover an excessive or more adequate iodine intake is observed. Therefore arises the necessity for a reduction of iodine exposure.

23.1% of children from Mures County and 13.4% of subjects from Harghita County presented hypoechoic and/or heterogeneous aspect on thyroid ultrasound, suggestive for autoimmune thyroiditis. In Harghita County children's group with characteristic ultrasound picture for chronic autoimmune thyroiditis, induced probably by more than adequate iodine intake, TPO-Ab positivity could have been demonstrated in about half of cases (43.75%).

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