

Understanding the co-occurrence of overweight and inadequate iodine intake: national cross-sectional study among Tunisian school-age children in 2012.

Introduction. Obesity is considered as a public health problem throughout the world. However, this is not exclusive of micro-nutrient deficiencies, including ID (Iodine deficiency), so that a number of countries have adopted universal salt iodization (USI) programs. Although these programs achieved some success in reducing ID, defaults in the process of salt iodization, were shown to increase the risk of iodine excess (IE). Also the nutrition transition which underlies the obesity epidemic is characterized by salt-rich diet, so that there could be a cumulative effect with respect to iodine status. In this work, we assess the co-existence of overweight and inadequate iodine intake.

Methods. A national cross-sectional study in 2012 used a stratified, clustered random sample of 6-12 y. children (the recommended target age class for the assessment of iodine status in populations) in Tunisia (n=1560). Overweight (Ow) was defined as body mass index (BMI)-for-age $\geq +1z$ according to the World Health Organization (2007). Urinary iodine concentration (UIC) was measured in casual urine samples using Sandell-Kolthoff method. At the individual level, we used international cut-offs: ID < 100 µg/L and excess of iodine (IE) ≥ 200 µg/L. Prevalence of double burden (DB) was expressed as weighted percentage (95% Confidence Interval). Chi-square tests and logistic regression models were used to examine the association of socioeconomic and demographic factors with the DB (Ow-ID or Ow-IE).

Results. The prevalence of overweight, ID and IE were 18.4% (95% CI:[15.5-21.7]), 11.4% (95% CI:[8.6-14.9]), 52.2% (95% CI:[50.1-62.2]), respectively. The overall prevalence of Ow-ID was 2.7% (95% CI:[1.4-5.3]) while Ow-IE was found among 9.8% (95% CI:[7.7-12.3]). Few associations were found between the co-occurrence of Ow-ID after adjustment to the socio-demographic characteristics of children. Adjusted regression analysis revealed that this Ow-IE was not associated to the gender, living area, father's instruction level and parent's occupational status. In contrast to the age increasing (OR=1.7; 95% CI:[1.1-2.7]), low mother instruction level was found as a protector factor from Ow-IE (OR=0.6; 95% CI:[0.4-0.9]).

Conclusion. The coexistence of overweight and inadequate iodine status seems to not heavily impact Tunisian children at the time of the study. Nonetheless, salt will be the catalyst in the occurrence of the Ow-IE DB: i) salt is proved to be an obesogenic molecule; ii) higher salt consumption is a driver for IE intake. Inadequacy of iodine intake may promote to overt hypothyroidism which is associated to the weight gain. In fine, cumulative effects of high salt intake, excess of iodine and unhealthy life style will probably have a prominent role in the genesis of Ow-IE DB. Anti-obesity and salt reduction policy should be closely monitored with the USI program to ensure the expected effects among population.

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