AJMS
(A US National Library of Medicine enlisted journal)
Al Ameen J Med Sci (2011)4(3):213-214
ISSN 0974-1143
CODEN: AAJMBG

SPECIAL EDITORIAL

Environment and Thyroid

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The thyroid gland is sensitive to multiple-environmental exposures. In the hilly regions, iodine is leached from the surface of the soil and by snow and rains and carried by wind, rivers and floods into the sea. As a result, humans and animal populations which are totally dependant on food grown in such soil becomes iodine deficient. Adequate amount of iodine is required for thyroid hormone synthesis. Thyroid hormone (T4 and T3) is essential in all phases of life cycle, including foetal and neonatal neurological development, overall growth, development, physical and mental efficiency, energy production and reproduction. The consequences of iodine deficiency are goiter (enlargement of thyroid gland), hypothyroidism, cretinism, reproductive failure, childhood mortality including socioeconomic retardation collectively known as iodine deficiency disorders (IDD) [1]. Environmental iodine deficiency of the earth is a forever a reality and iodine deficiency in the population is forever a risk. Therefore universal salt iodization (USI) programme has been placed throughout the globe including India. Despite tremendous global progress over the last two decades, approximately 2 billion people worldwide remains at risk of IDD. In addition, epidemiologic studies have demonstrated that a large number of region-specific environmental exposures found in food and water may disrupt thyroid gland posing the danger of thyroid disorders despite dietary iodine sufficiency.

Factors other than iodine deficiency are responsible for the persistence of goitre in Western Colombia, Eastern Kentucky, Saxony, Italy, Brazil and many other countries including India. In Eastern India, inspite of effective salt iodization as evidenced by urinary iodine excretion pattern, the prevalence of goiter and associated disorders did not decline [2-3]. The entire North-East India is in the classical goiter endemic belt of India. Considering the consequences of IDD, USI programme initiated in the entire region in 1988-89, however no decrease in goiter prevalence was found even after a decade of the implementation programme in Tripura and Manipur [4-5]. In Sundarban delta and adjoining Gangetic West Bengal, in post salt iodization phase, endemic goiter and associated disorders (IDD) found prevalent among children [6-7]. In Andhra Pradesh and Kerala endemic goiter is prevalent [8].

Goitrogenic and antithyroidal substances present in food and water in environment other than iodine deficiency may have role for the persistence of endemic goiter inspite of adequate iodine intake. More investigation is thus necessary to reach a certain definite cause of high goiter prevalence in the population during post-salt iodization phase.

Mild and moderate iodine deficiency also affects the intelligence, fine motor skills, problem solving capacity etc. of the children. Successful iodization programme along with identification of region specific environmental goitrogens and appropriate measures to counter their effects are needed to prevent and control this public health problem.

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Editor's note: Prof.Amar K Chandra is a pioneer in the field of thyroid physiology with special reference to iodine nutrition and environmental goitrogens. He is a Member of International Council for Control of Iodine Deficiency Disorders. Professor Chandra is also the President of South Asian Association of Physiologists (SAARC Countries).