



Iodine Deficiency Consequence in Children and their Future Productivity

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DESCRIPTION

Iodine is an essential trace mineral that is required for the production of thyroid hormones, which regulate the metabolism, growth and development of the body. Iodine deficiency can have serious consequences for children's health, especially during fetal life, infancy and childhood, when the brain and nervous system are developing rapidly. Iodine deficiency can result from inadequate intake of iodine-rich foods, such as seafood, dairy products, eggs and iodized salt, or from exposure to environmental factors that interfere with iodine absorption or utilization, such as goitrogens (substances that inhibit thyroid function), excess fluoride or chlorine, or certain medications. Iodine deficiency in neurodevelopment explores the effects of insufficient iodine intake on the brain and nervous system, especially during fetal life and early childhood. It is an essential component of thyroid hormones, which regulate many aspects of growth and development. This deficiency can impair thyroid hormone synthesis and cause hypothyroidism, which can have serious consequences for neurodevelopment.

The most visible sign of iodine deficiency is goiter, which is an enlargement of the thyroid gland due to its overstimulation by Thyroid-Stimulating Hormone (TSH). Goiter can cause difficulty in breathing, swallowing and speaking, and may compress the trachea or blood vessels in the neck. However, goiter assessment by palpation or ultrasound may not be reliable once salt iodization programs have started, as iodine intake may vary over time and among individuals. The most serious consequence of iodine deficiency is its impact on the brain and nervous system. Severe iodine deficiency during pregnancy can cause cretinism, a condition characterized by irreversible mental retardation, deafness, muteness, spasticity and dwarfism. Cretinism affects millions of people living in iodine-deficient areas.

Less severe iodine deficiency during pregnancy can also impair fetal brain development and increase the risk of miscarriage, stillbirth and congenital anomalies. Even mild to moderate

iodine deficiency can reduce the Intelligence Quotient (IQ) of children by 10 to 15 points, affecting their academic performance and future productivity. Iodine deficiency can also affect other aspects of children's health, such as their immune system, growth and puberty. Iodine deficiency can cause hypothyroidism (low levels of thyroid hormones), which can manifest as fatigue, weakness, cold intolerance, constipation, dry skin, hair loss and weight gain. Hypothyroidism can also lead to delayed growth and sexual maturation, as well as increased susceptibility to infections. On the other hand, iodine deficiency can also cause hyperthyroidism (high levels of thyroid hormones), which can manifest as nervousness, irritability, insomnia, palpitations, heat intolerance, diarrhea, weight loss and exophthalmos (bulging eyes). Hyperthyroidism can also lead to accelerated growth and early puberty, as well as increased risk of cardiac arrhythmias and osteoporosis.

CONCLUSION

Urinary iodine concentration is considered to be the main indicator of iodine status for all age groups, because it reflects recent iodine intake and can be measured easily and inexpensively. The most effective strategy for the prevention and control of iodine deficiency is Universal Salt Iodization (USI), which requires that all food-grade salt be fortified with a suitable amount of iodine. USI has been implemented in many countries around the world and has been shown to reduce the prevalence of goiter and improve the cognitive function of children. However, USI may not be sufficient or feasible in some regions or for some vulnerable groups, such as pregnant women, infants and young children. In these cases, other forms of iodine supplementation may be needed, such as iodized oil capsules or drops, iodized water or bread, or prenatal multivitamin supplements containing iodine. Iodine deficiency is a major public health problem that affects nearly one third of children worldwide and is considered to be the leading preventable cause of intellectual deficits. Therefore, it is important to ensure adequate iodine intake for children's health and development through dietary sources or supplementation.

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