

Iodine Deficiency and Sub-clinical Cretinism in India

Nutritional iodine deficiency and endemic goitre are widely prevalent in India. Surveys conducted by the National Goitre Control programme showed high prevalence areas of endemic goitre in 75 of the 88 districts in 14 states of India. A more recent country-wide survey for extra-Himalayan foci of endemic goitre revealed prevalence of goitre in all the 14 districts studied.¹ In all investigations nutritional iodine deficiency has been shown to be the cause of endemic goitre in India² where an estimated 150 million people live in an iodine deficient environment.

Till 1973, it was believed that the compensatorily enlarged thyroid in iodine deficient individuals resulted in euthyroidism. This supposition fostered an attitude of benign neglect towards endemic goitre as a health problem.³ However, in 1973, studies to evaluate the thyroid status of endemic goitrous subjects in the sub-Himalayan region, using newly available specific and sensitive parameters, showed that basal thyroid stimulating hormone (TSH) levels and peak TSH response to thyrotrophin releasing hormone (TRH) were significantly higher in goitrous subjects when compared to controls. Besides, these levels were directly related to goitre size and inversely related to thyroxine and effective thyroxine ratio, indicating that sub-clinical hypothyroidism existed in more than half the goitrous subjects studied.⁴

While this was a disconcerting observation, a question of more serious concern was the thyroid status of neonates in iodine deficient areas. This is because thyroxine plays an important role in early brain development and the brain damage caused by neonatal hypothyroidism is largely irreversible.

To assess neonatal thyroid status in socio-economically backward and iodine deficient areas of northern India, studies on large populations had to be organized using cost-effective radioimmunoassay technology. In 1984, a cord-blood based neonatal hypothyroid screening programme using new field strategies was carried out in randomly selected Primary Health Centres of the Gonda and Deoria districts of Uttar Pradesh.^{5,6} Over 15 000 newborns have been screened and the results showed that 10% to 15% had severe iodine deficiency-related thyroid failure at birth. Similar results have been reported from endemic areas of Zaire.⁷ Studies to assess the impact of thyroid failure on the brain development of people living in endemic villages of Deoria⁸ district of Uttar Pradesh showed a 3% to 5% prevalence of cretinism, IQ scores of less than 70 (mild mental retardation) in as much as 23% of primary school children of endemic villages, and a prevalence of neonatal hypothyroidism of 15% or more. There was also a 20% prevalence of nerve deafness, a hallmark for iodine deficiency-related brain damage. These results suggest that sub-cretinous brain damage occurs in endemic populations in addition to overt cretinism.

In 1986 the Government of India adopted a policy of iodine prophylaxis through universal iodization of edible salt to check the wide prevalence of nutritional iodine deficiency. This scheme is expected to be fully implemented by the year 1992 and several states of northern India have already been covered. Preliminary evaluation of the impact of the programme in Uttar Pradesh has indicated a reduction in the incidence of neonatal hypothyroidism from 99 to 26 per thousand in endemic districts.⁹ The continued and effective implementation of this policy of universal salt iodization is important if the socio-economically backward endemic goitrous districts of India are to progress.

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