

Iodine Deficiency, A Tale of Misery of Gallongs of Village Ragi Doke, Siang Division, Arunachal Pradesh

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Thyroid hormone plays a very vital role in the development of the brain as well as the body. Iodine is very essential for the production of thyroid hormones. Lack of iodine results in different kinds of health problems that are called Iodine Deficiency Disorders (IDD). The most obvious sign of iodine deficiency is goitre. It is an enlargement of the iodine-storing thyroid gland in the front part of the neck, caused by the body's efforts to make up for the iodine deficiency. This is one of the long recognised reasons for the enlargement of thyroid gland in goitre belts. Some other goitrogenic conditions which have been suggested by Hubble (1964) in addition to deficiency of iodine, are certain vitamin deficiencies, excess of fat or fatty foods, cabbage, nuts, maize, turnip. Certain periods during life are also thought to increase the appearance of simple goitre, namely at puberty, pregnancy and menopause. The theory of goitre at such times is due to increased physiological demand and less of iodine in the system.

Low levels of thyroid hormones in the blood is called hypothyroidism. It produces sluggishness, sleepiness, dry coarse skin, cold intolerance and constipation. According to Hurxthal (1964) the exact definition of cretinism is nowhere to be found. "All instances of thyroid deficiency before epiphyseal closure or the normal time of epiphyseal closure is called cretinism." It is a congenital defect in which the child's development, mental and somatic is delayed or arrested. The cretins have severe irreversible mental retardation, dystrophy of skeleton, bilateral hearing loss and speech abnormality. Cases of cretinism are frequent in areas where endemic goitre is widespread (Carruto et al., 1974). Cretinism is also some-

times known as infantile hypothyroidism. In this disorder there is a congenital defect of the thyroid which may fail to develop at all or may lack one of the several enzymes needed for the synthesis of the thyroid hormones. These defects are inherited as Mendelian recessive; in the heterozygous state the child may be goitrous only, but in the homozygous state the child will be goitrous and cretin (Davidson, 1971). Iodine deficiency also leads to miscarriage and still birth.

Goitre may occur sporadically but sometimes it is more frequent in certain parts of the world and then it is referred to as 'endemic goitre'. Endemic goitre regions are well known and are generally centred around mountainous areas away from the sea. In these areas the soil loses iodine due to glaciation, heavy rain and deforestation on the mountain slopes. Endemic goitre area in India is found in the Himalayan and sub-Himalayan belt stretching from Jammu and Kashmir to the north-east (Fig. 1). Identifying the public health problem posed by the Himalayan endemic goitre, Government of India initiated the National Goitre Control Programme (NGCP) towards the end of Second Five Year Plan in 1962. The NGCP's objectives were: 1. To carry out surveys to identify endemic areas; 2. To supply iodised salt to endemic areas; 3. To conduct surveys after periodic intervals to assess the impact of the programme.

In view of the clearly laid-down objectives of NGCP the findings of our investigation conducted in 1975 in a village called Ragi Doke of Tirbin Circle in Siang Division of Arunachal Pradesh, would not be out of context for the simple reason that if any preventive measure has been taken then there should be decline in the number of goitrous persons, cretins, and dwarfs in this village.

Ragi Doke is a typical village of Gallong

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Fig. 1. Indian region showing endemic goitre effected areas

tribe of Siang Division of Arunachal Pradesh. It is situated at a distance of about 64 km south-west of Along, the head quarters of Siang Division. The altitude of the village is about 795 meters and is surrounded from all sides by hills and jungles. In the village there were 27 households accomodating 42 families.

The entire population of Ragi Doke village belongs to Gallong tribe which is one of the major groups among the Adis. Gallongs are divided into several clans. In the village Ragi Doke, the main clan is Doke though there are others like Rumdo, Lumbi, Taluk and Bamjan. Gallongs observe strict clan exogamy. Agriculture in the form of Jhum (shifting cultivation) is the main source of livelihood. In the Jhum fields apart from paddy, maize, ragi (millet) and few varieties of vegetables are also grown. Gallongs do not use milk or milk products though they domesticate cows. They rear goats for their meat.

Ragi Doke village had a population of 225 individuals of which 108 were males and 117

females. This village had an exceptionally high incidence of endemic goitre and criticism of varying degrees of severity. Table 1 gives the number of persons having goitre.

It is seen that about 15 per cent of the total population of the village suffered from goitre in varying degrees. The frequency of goitrous females was higher than the goitrous males. We came across with families where all the members had goitre of considerable size. There were families where non-goitrous parents had children with goitre and goitrous parents had normal children. There were cases also where goitre was associated with retarded growth, feeble mindedness and deaf-mutism (Fig. 2). Apart from few cases of mentally retarded individuals three males of different age groups were identified as critins (Fig. 3).

The term 'dwarf' is a general one applied to all individuals who are markedly smaller than the average. Here it is used with reference to two distinct types (a) Achondroplastic dwarfs and (b) Ateleiotic dwarfs. The former have a trunk of normal length, short limbs and large joints. The latter are miniatures of normal proportions. They are also known as midgets, miniatures, tom thumb or true dwarfs. Ateleiotic dwarfs at the time of birth are of normal size, but the growth is very slow and it is usually sus-

Table 1 : Incidence of goitre in village Ragi-Doke

Population			No. of goitrous persons		
Male	Female	Total	Male	Female	Total
108	117	225	14	21	35
			12.9%	17.8%	15.5%



Fig. 2. Adult Gallong male—a case of deaf-mutism, retarded growth and goitre



Fig. 4. A 16 years old female dwarf with a normal Gallong women

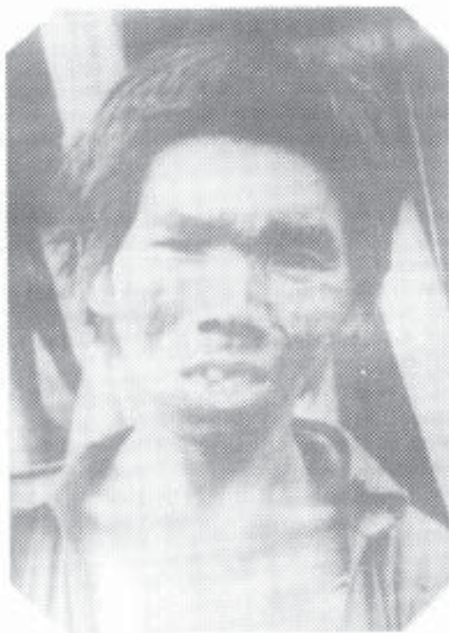


Fig. 3. A deaf-mute Gallong—a case of cretinism



Fig. 5. A 25 years old male dwarf with a normal Gallong male

pended early. The face is flat, the features are babyish, the hands and feet are very small. These little people are too frail and most of the time sterile (Rischbieth, 1912). Achondroplastic dwarfs in man are heterozygous for a dominant gene with complete penetrance (Dobzhansky, 1962).

It has been suggested by Hurxthal (1964) that the Thyroid deficiency may cause retardation of growth, not only because of the lack of production of thyroxine by the thyroid gland in the system, but also because there is reason to believe that growth hormone of the pituitary gland depends on the normal secretion of the thyroid gland. Deficient function of the thyroid gland results in stunted growth, retarded ossification of the cartilage and the under development of the sex organs.

In village Ragi Doka several cases of retarded growth were noted. There were two males and one female who had normal limbs but shortened trunk and hunch back (Figs. 4, 5). These three cases of dwarfism were neither achondroplastic nor steleiotic but appeared to be due to the disorder of the thyroid gland causing the retardation of the vertebral column and fusion of the thoracic vertebrae giving an appearance of hunch back.

Anthropometric measurements were taken to see the contrast in the physical make up between the normal individuals and those with retarded growth and dwarfism. It was found that the normal Gallongs had short to medium stature with a mean value of 158.30 cm. They had dolicocephalic (59.0%) to mesocephalic (40.9%) head and leptorrhine (50.0%) to mesorrhine (36.4%) nose form. Their faces were medium to broad with prominent cheek bones and chin. They were moderately built having an average weight of 52.5 kg. Those who had retarded growth (6 in No.) were found to be short with an average height of 141.82 cm. They also had dolicocephalic head and mesorrhine nose. The dwarfs (2 in No.) were shorter (115.9 cm) than the category of very short persons as per Martin (1928). They had dolico-

cephalic head and leptorrhine nose. There was a marked reduction in all the linear measurements of the dwarfs and an increase in their chest depth which indicated a pigeon shaped chest. The ratio of sitting height to stature was also least among them.

The sale of common white salt was banned in Arunachal Pradesh. It is hoped that iodised salt was made available to the people and other supplementation measures were introduced suitable for sections of the population at high risk such as women in the reproductive age group, and children. The information presented above may be taken as base line for further comprehensive study among the Gallongs of Ragi Doka and many other villages that fall in the goitre belt of Arunachal Pradesh.

ACKNOWLEDGEMENTS

Our thanks are due to the then Director of Health Services, Dr. A.K. Bhattacharya, District Medical Officer of Siang Dr. B.M. Chowdhary and Asstt. Medical Officer, Dr. A.K. Sikdar, Tirbin (All from Arunachal Administration) for giving all possible facilities and help.

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