

Prevalence of Endemic Goitre in Two Unions of Jamalpur District

A.K.M. Moniruddin Chowdury¹, Mohammad Shafiqur Rahman¹, Golam Kibria Ferdous², Jennifer Choudhury³, A.B.M. Alauddin Chowdhury⁴, Rabeya Aktar⁵, A.R.M. Myeenuddin Chowdhury⁶ and Shamima Sultana¹, Md. Akram Hossain¹

¹Mymensingh Medical College, Mymensingh; ²Department of Social Work, Rajshahi University; Rajshahi; ³ICDDR,B Mohakhali, Dhaka; ⁴Socio-economist, LGED; Department of Statistics, University of Dhaka, Dhaka 1000; ⁵Department of Behavioral Science, Hokkaido University, Sapporo 060, Japan

Abstract

A study was carried out in two unions of Dewanganj thana under Jamalpur district to find the prevalence of endemic goitre and to assess the knowledge, attitude and practice regarding iodized salt among the population. There were 375 goitre cases out of 1050 people, the percentage was 35.7%. Goitre prevalence was more in 41 to 50 age group. The females (56.8%) were more sufferers than males. Regarding occupation majority were housewives (47.47%) and cultivators were in the second position (20%). Majority of the respondents was illiterate. Most of the respondents took iodized salt. Among the goitre cases who did not take iodized salt 19% could not take iodized salt because of high cost and only 2% due to ignorance.

Key Words : Endemic Goitre, Jamalpur District, Iodized Salt

Introduction

An enlargement of the thyroid gland is called goitre¹. Endemic goitre has been defined as the presence of generalized or localized thyroid enlargement in more than 10 percent of the population² in certain geographic location especially those in which iodine is deficient in food and water.

Iodine is an essential micronutrient which is required for the synthesis of thyroid hormones (Thyroxine and Tri-iodothyronine)³. About 90% of hormones secreted by the thyroid gland is thyroxine. To form normal quantities of thyroxine, approximately 50 mg of ingested iodine in the form of iodide are required each year or 150 µg / day^{3,4}. The adult human body contain 50g of iodine and the blood level is about 8-12 µg / dl. Almost 90% of iodine comes from foods eaten, the remaining from drinking water. The best sources of iodine is present in sea food (e.g., sea fish, sea salts). Small

Bangladesh Journal of Nutrition, Vol 15 December 2002. Institute of Nutrition and Food Science, University of Dhaka-1000, Bangladesh.

* Author for correspondence

amount of iodine is present in meat, milk and vegetables. The iodine content of fresh water is little and is varied widely, 1-150 $\mu\text{g} / \text{L}^3$.

The iodine deficiency leads to decreased synthesis of thyroid hormones. Impairment of thyroid hormone synthesis leads to compensatory rise in the serum TSH levels, which, in turn, causes hypertrophy and hyperplasia of thyroid follicular cells and ultimately gross enlargement of thyroid gland⁵.

In our country the first national goitre prevalence study was done between July, 1981 and December, 1982 by the Institution of Public Health and Nutrition, Mohakhali, Dhaka, with the collaboration of WHO and UNICEF and national prevalence was found to be 10.51%. The result indicated the whole country to be endemic. However, the endemicity varied greatly from district to district⁵. The first national Iodine Deficiency Disorders (IDD) survey which was conducted in 1993 revealed that IDD situation was severe in all the three zones of the country and clinically there was not much difference in total goitre rates (TGR) in these zones (on an average 47.1%; zone wise, hilly 44.7%, flood prone 50.7%, plain land 45.6%). At that time, about 10% of the salt available in the market was iodized⁷. Since then, percentages of iodized salt available in the market increased steadily and by 1995, all salts available in the market should have iodized. Two evaluation surveys of Universal Salt Iodization (USI) programme in Bangladesh were successfully conducted (November 1996, January 1999). In both surveys, it was found that almost 99% edible salts available in the market /households were iodized; however, the amount of iodine in the salt was not maintained as per law in 67% cases⁸.

On the basis of the above two USI survey results and in the context of the International goal that IDD should be eliminated by 2000 AD, and also to compare the present situation with that observed during 1993, the first follow up national IDD survey was conducted during the last half of 1999. A total of 20,978 subjects were surveyed. The overall total goitre prevalence was 17.8% (hilly 19.8%, flood prone 13.7%, plain land 20.4%)⁸.

According to goitre prevalence study of Bangladesh, Dewangonj thana was a goitre endemic area⁹. Geographically, Dewangonj thana is situated in such a position that two turbulent rivers, Brahmaputra and Jamuna run along its side. Naturally, a major portion of essential iodine is continuously being swept away from the soil and water of this area. Eventually the people living in this area always face the risk of iodine deficiency.

Materials and Methods

This was a cross sectional descriptive study. It was conducted from the 25th November to the 8th December, 1997 and the 25th December, 1997 to the 7th

January, 1998. The study places were two unions: Dewangong Sadar and Chukibary, under Dewangong thana in the district of Jamalpur. A structured questionnaire was prepared. It was pretested and duly modified. Research team was composed of medical doctors, social workers and students. Before the survey all were duly trained to detect the goitre. All the houses of these two unions were visited and 1050 people were selected randomly by palpation and 375 goitre cases were found and interviewed. Data compilation and analysis was done on the basis of individual variables such as age, sex, economic condition and educational status and so on.

Results

There were 375 goitre cases of both grade 1 and grade 2 out of 1050 people. The total goitre prevalence rate was 35.71% (Table 1).

Table 1. Prevalence of goitre according to age group

Age Group	Total Population	No. of Goitre Cases	Percentage of Goitre
5-10	128	18	4.80
11-20	171	30	8.00
21-30	102	39	10.40
31-40	149	75	20.00
41-50	301	109	29.06
51-60	148	83	22.14
61+	51	21	5.60
Total	1050	375	35.70

Table 1 also shows the prevalence of endemic goitre according to age group. The prevalence was highest (29.06%) in the age group of 41-50 years and lowest in the age of group of 5-10 years.

Table 2. Distribution of goitre subjects according to sex

Sex	Total Population	No. of Goitre Cases	Percentage of Goitre
Male	501	162	43.20
Female	549	213	56.80
Total	1050	375	35.70

Table 2 shows that prevalence of endemic goitre is more in female (56.80%) than in male (43.20%).

Table 3. Distribution of goitre subjects according to educational status

Educational Status	No. of Goitre Cases	Percentage of Goitre
Illiterate	214	57.07
Primary	89	23.73
Secondary(SSC)	38	10.13
HSC	27	07.20
Graduate	07	01.87
Total	375	35.70

Table 3 shows that majority (57.07%) of the goitre cases were illiterate, 23.73% were educated up to primary level and 1.87% were graduate.

Table 4. Distribution of goitre subjects according to economic status

Economic Status (Monthly income -TK.)	No. of Goitre Cases	Percentage of Goitre
Very poor (500-1000)	29	7.73
Poor (1000-3000)	213	56.80
Middle class (3000-5000)	108	28.80
Rich (5000-10000 or above)	25	06.67
Total	375	35.70

Table 4 shows that the majority (64.55%) of the goitre cases were poor, followed by middle class (28.80%) and rich (6.67%).

Table 5. Distribution of goitre subjects according to occupation

Occupational Status	No. of Goitre Cases	Percentage of Goitre
Cultivator	75	20
Labour	18	4.8
Business	31	8.27
Service	29	7.73
Housewife	178	47.47
Students	44	11.73
Total	375	35.70

According to table 5, majority of the goitre cases were housewives (47.47%), followed by cultivators (20%) and students (11.73%).

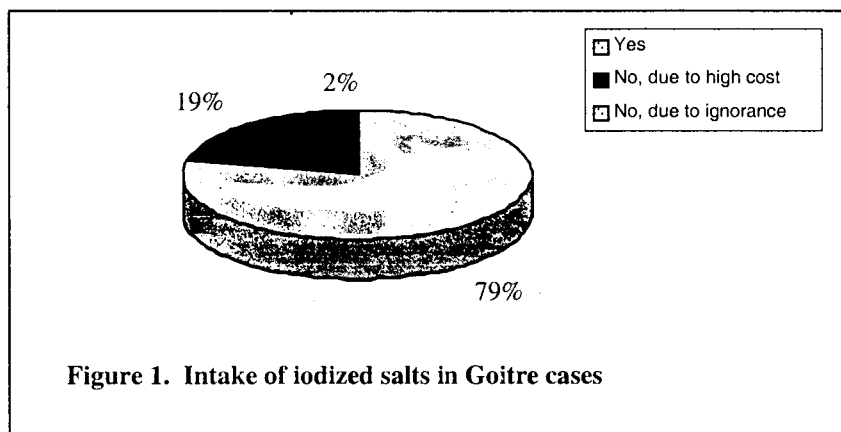


Figure 1. Intake of iodized salts in Goitre cases

Figure 1 shows that 79% of the goitre cases consumed iodized salt and the remaining 21% did not consume iodized salt. Of the people who did not take iodized salt, 19% of goitre cases could not take iodized salt because of high cost and only 2% due to ignorance.

Discussion

Iodine deficiency disorders(IDD) are recognised as a major global public health problem. According to the latest estimates, some 1.57 billion people worldwide are at risk of IDD, 655 million people are goitrous and about 20 million suffer from varying degrees of mental handicap related to iodine deficiency^{10,11}. In fact, iodine deficiency is the single most preventable cause

of neurological and intellectual impairment (cretinism) in the world today. Again endemic cretinism occurs in population suffering from endemic goitre. So the public health significance of endemic goitre is greatly increased. South-east Asia shares the largest rate of prevalence of IDD, with an estimated 486 million are at risk and 176 million having goitre. The countries with severe iodine deficiency in Asia are Bangladesh, Bhutan, China, India, Indonesia, Myanmar, Nepal and Thailand. Simplest approach to control IDD is the iodination of salt for household use. Injection of iodinated oil has been also proved to be effective for a long lasting source of iodine. One millilitre injection will provide protection to an individual for 3-5 years¹².

In agreement with previous findings^{7,8}, the rate of endemic goitre was high among the females (56.80%, Table 2) than the males (43.20%). This may be due to the increased physiological need at child bearing age. Moreover, the greatest vulnerability of pregnant women's toward iodine deficiency is due to the higher foetal requirement for growth and development¹³. It was found that hundred percent goitre cases drank tube well water which proves that this source is devoid of required quantity of iodine. Most (79%) of the goitre cases now consume iodized salt (Figure 1). They mentioned that their goitre had been developed before the use of iodized salt. The remaining 21% (Figure 1) of goitre cases did not consume iodized salt due to high cost (19%) and lack of knowledge (2%).

To meet the deficit of iodine in human body, the government of Bangladesh enacted a law in February, 1989 for producing, selling and using iodized salt and this is encouraged by different media such as TV, radio and health workers of government and non-governmental organizations. As per law, producing and selling of non-iodized salt are strictly prohibited. The poor people in remote areas who are still unaware of the benefit of iodine are randomly using the sub-standard salt. Legislation, needless to say, is not enough to ensure daily intake of iodized salt. As long as the non-iodized variety is available at a cheaper price, the poor people would prefer to save a few taka when purchasing salt for family members and farm animals. The authorities should do well to eliminate the manufacture and marketing of non-iodized salt as well as to monitor the finished product for the right mix and right price¹⁴.

References

1. Donald V, Clayton LT, Elizabeth J E, Nancy A M, and Allison D N, Taber's Cyclopedic Medical Dictionary. FA Davis Company, Philadelphia, Pennsylvania, 1997; p. 752.
2. Anthony S F, Eugene B A B, Kurt J I, Joseph B M, Jean D W, Richard K R, Dennis L K, Stephen L H and Dan L L. Harrison's Principles of Internal Medicine 14th edition. McGraw-Hill Companies, Inc. New York, 1998; 2: 2019.
3. Park K. Park's Text Book of Preventive and Social Medicine. 15th edition. M/S Banarsidas Bhanot Publishers Jabalpur, India. 1997; p 404.
4. Guyton, C. A. Text Book of Medical Physiology, 9th edition, W.B. Saunders Company, Philadelphia. 1997; p. 954.

5. Vinay K., Ramzi S C and Tucker C. Robbin's Basic Pathology, 6th edition, W.B. Saunders Company, Philadelphia, 1999; p.646-7.
6. Paul S N. Prevalance of Goitre at Lalmonirhat District and its impact in the community –Dissertation of the student of DPH of NIPSOM, 1986; p. 614.
7. Yusuf, H K M, Salamatullah Q, Islam M N, Hoque T, Baquer M and Pandav C S. Report on national iodine deficiency disorders survey in Bangladesh, 1993. Dhaka University, Dhaka, Bangladesh. Lancet, 1994; 343: 1367.
8. IDD survey in Bangladesh-1999, IDD Newsletter, Vol.5, December 2000.
9. Begum, Piara. Knowledge, Attitude and practice of the use of iodized salt among the house wives of community in the District Mymensingh-Dissertation of the student of MPH (CM) of NIPSOM, 1995-96; p.15.
10. Global Prevalence of Iodine Deficiency Disorders-Micronutrient Deficiency Information System (MDIS) Working Paper No.1, p.5. WHO/UNICEF/ICCIDD, 1993 and ICCIDD Monthly Update; September, 1993, p.3 (ed.Dunn,J.T.).
11. Hetzel B S. An overview of the prevention and control of iodine deficiency disorders. In "The prevention and Control of Iodine Deficiency Disorders" (Hetzel, B.S.; Dunn, J.T. and Stanbury, J.B., eds), p.17. Elsevier, Amsterdam, 1987.
12. Rashid K M; Khabiruddin, M. and Hyder S. Text Book of Community Medicine and Public Health. 1st Edition, RKH Publishers, Dhaka 1999; p.128.
13. Malvaux P and Baker C. Serum free thyroxin binding proteins in male adolescent J.Clin.Endocrinol, 1996; 26:45-46.
14. Report of national goitre prevalence study of Bangladesh (1981-82). Institute of Public Health & Nutrition., Minstry of Health and population Control, Dhaka, 1983.