

## **INTERNAL REVIEW: Iodine Deficiency Disorders (IDD) in the Federation of Bosnia and Herzegovina**

A report was prepared on the implementation of the project “Assessment of the current status of iodine prophylaxis of goitre in the Federation of Bosnia and Herzegovina”

### **Introduction**

A large body of historical and scientific data indicates that in the past Bosnia and Herzegovina was a iodine-deficit region, where goitre was frequent and was even endemic in some areas. That is why in 1953 the Law on Obligatory Iodising of Salt for Human and Animal Consumption was passed. The implementation of this Law contributed to a lower frequency of goitre in the population of Bosnia and Herzegovina, but not to its eradication. In early 1990s and after the war, goitre was again occurred frequently in Bosnia and Herzegovina, which required development of a National Programme for prevention of IDD. One of the objectives of the Programme was to assess the successfulness of the existing iodine prophylaxis, by establishing the prevalence of goitre, the concentration of iodine in urine, and the quantity of iodine in salt samples from households. On the basis of these results, a strategy for further activities to prevent IDDs would be proposed.

### **Achievements**

A survey was conducted in 5,523 school children, chosen by random, of 7 to 14 years of age, of both sexes, with an even distribution in terms of age and place of residence (town-village). The sample was representative and was assessed on the basis of: the total number of school children aged 7 to 14, the supposed prevalence of goitre of 5%, the probability of a 95%; relative accuracy of 30%, and the factor known as the “design effect”, which is 3. The survey was conducted in primary schools in ten Cantons. The size of the thyroid gland was assessed using the methods of inspection and palpation. The concentration of iodine in urine was established by the method based on the Sandell-Kolthoff reaction, and the concentration of iodine in salt by the method of iodine-metric vibration.

The established frequency of goitre in FBiH was 27,06% - ranging from 12,90% in the West Herzegovina Canton to 51,20% in the Bosnia-Podrinje Canton. The concentration of iodine in urine ranged from 1 to 208 µg/L, with the average of 77,6 µg/L. The concentration of iodine in the household salt samples ranged from 3 to 29,8 mg/kg, with the average of  $14,4 \pm 5,9$  mg/kg.

The results indicate that there is a small to moderate degree of iodine deficiency in Federation of Bosnia and Herzegovina and that, according to the recommendations of the World Health Organisation, UNICEF, and ICCIDD, it is necessary to iodise the salt for human and animal consumption at the point of production with 20 to 30 mg of iodine per 1 kg of salt, i.e. that the average iodine content in 1 kg of salt should be 25 mg, regardless of whether the salt was produced in or imported into Federation of Bosnia and Herzegovina.

We would thus prevent a whole range of diseases, some of which are not always known to be caused by an iodine deficit. In addition, it would prevent social and economic consequences of iodine deficiency.

The UNICEF Office for Bosnia and Herzegovina provided the financial resources to purchase a modern salt iodising machine, for the Tuzla Salt Factory, the main supplier of iodised salt for Bosnia and Herzegovina. The machine was put into operation at the beginning of 1999, and facilitates the iodising of salt with different concentrations of iodine.

On 30 June 1999, a seminar on the topic of "IODINE AND HEALTH" was held at the Tuzla Salt Factory. The seminar was attended by 80 participants from FBiH and RS. Among the attendees were representatives of the Federation Government, the Federation Institute for Public Health, the UNICEF Office for Bosnia and Herzegovina, and the Cantonal Ministry of Health. The aim of the seminar was to provide medical staff, the staff working on production of iodised salt, and sanitary inspectors with information on the importance of iodine for the human body, as well as on the results of the survey concerning the status of iodine prophylaxis of goitre in FBiH. The conclusions of the seminar recommended that salt should be iodised with 20 to 30 mg of elementary iodine and that KJ or KJO<sub>2</sub> should be used as the iodising means.

3,000 copies of a leaflet on iodine and health, intended for the education of the general public on the prevention of IDD, were printed. The leaflet was distributed throughout FBiH.

6,500 copies of the brochure "IODINE AND HEALTH", intended for education of the general public regarding the importance of iodine for human health, were printed, in Bosnian and English. It was distributed free-of-charge in FBiH.

The Federation IDD Committee was established. On 25 January 2000, a meeting of the Federation IDD Committee was held at which it was recommended that work should start on development of a new Rule Book on the Iodisation of Salt. The committee recommended that salt used for human, as well as animal consumption, should contain 20 to 30 mg of iodine per kilogramme, and that an initiative should be launched for education of the general public regarding the use of food items rich in iodine and the proper manner of keeping and using iodised salt.

On 15 March 2000, the Committee agreed that salt should be iodised at the point of production with 20 to 30 mg per 1 kg of salt, i.e. that the average iodine content in 1 kg of salt should be 25 mg and that KJ or KJO<sub>3</sub> should be used as the iodising means. In addition, it was agreed that salt should be packed in 1 kg cardboard packaging, and subsequently that the shelf life would be one year. If the above proposal is accepted, it will be necessary to conduct a new survey to assess the success of the new level of iodine prophylaxis, six months after the new salt is circulated. Based on the results of that survey, corrections in terms of the iodine content in salt for human consumption should

be made. A final version of the Rule Book on the Quality of Salt for Human Nutrition should be developed.

The operation of the Laboratory for Neo-Natal TSH Screening of the Tuzla Clinic for Child Diseases was assisted through the purchase of the reagents needed to operate the laboratory for three months. Neo-Natal TSH Screening has also started in Central Bosnia Canton. The results of neo-natal TSH screening will be used to assess the success of iodine prophylaxis of IDD.

The leaflet “Early Detection of Congenital Hypothyroidism” was printed (3,000 copies) with the aim of stressing the necessity for the early detection of congenital hypothyroidism and IDDs. The leaflet was distributed to pregnant women and child-bearing women in the two Cantons.

The monograph “Iodine Deficit in Bosnia and Herzegovina” was produced and printed (1,000 copies) with the aim of elaborating on the problem of IDD in Bosnia and Herzegovina.

The implementation of the educational programme for medical staff entitled “LET’S PREVENT DEVELOPMENT OF IDDs”, which addresses the importance of iodine for human nutrition and preventive measures for IDD in FBiH, has started. Five seminars have been held in Tuzla Canton, attended by 75 medical workers (nurses, general practitioners and doctors of family medicine, paediatricians and gynaecologists). The seminars had a large number of participants, and the attendees showed a great interest in learning about this topic. An evaluation of their knowledge before and after the seminar established that their knowledge regarding the importance of iodine for human consumption and IDDs was increased by 20,11% on average.

The brochure “Let’s Prevent Development of IDDs” was printed (1,000 copies) as the working material for the participants in the seminars. The participants received 20 additional brochures for other medical staff in their place of work.

The paper on the results of the survey of iodine prophylaxis in FBiH has been accepted for publication in the Journal of Endocrinology Investigation, and under the title “Jodni deficit u Bosni i Hercegovini” in the local medical journal “Medicinski arhiv”.

### **Difficulties**

No major difficulties in achieving the set objectives were observed, but the procedure of adoption of the Rule Book on Iodisation of Salt by the responsible Ministry is rather slow. This constituted one of the obstacles to achieving the other objectives of the Programme.

### **Future plans**

The Programme should be extended to cover the following segments:

1. Adoption and application in practice of the Rule Book on Iodisation of Salt. In this respect, it is necessary to speed up the procedure of adopting the Rule Book, as well as to eliminate possible ambiguities.

2. Introduction of a system of regular control of iodised salt at the points of production, import, trade, and in households. This control should be based on the law and should be regular.
3. Education of municipal, cantonal, and Federal Sanitary Inspectors regarding the importance of iodine for nutrition and the method of controlling the quality of salt in terms of iodine content. The training should take place after the adoption and application of the Rule Book.
4. Organisation of a symposium on IDD in the region at the Bosnia and Herzegovina Academy of Arts and Sciences in Sarajevo. The Symposium is to be attended by the IDD National Co-ordinators of the neighbouring countries, as well as by the Executive Director of the International IDD Council. The aim will be to emphasise the importance of the IDD problem and exchange experiences of the resolution of this problem.
5. Continuation of the education of medical staff who will pass on the message about the importance of iodine for health to the population in other parts of FBiH.
6. Assist the laboratories (the Factory laboratory, the food control laboratories of Cantonal and Federation Public Health Institutes) through the purchase of reagents and necessary equipment.
7. Assist the laboratory for measuring iodine content in urine at the Tuzla Clinic for Child Diseases through the purchase of reagents and necessary equipment.
8. Improve and expand the operation of the Laboratory for Neo-Natal TSH Screening at the Tuzla Clinic for Child Diseases to over the whole country. This would include the purchase of reagents. The laboratory's results will be used to assess the status of the iodine deficit in Bosnia and Herzegovina. External control of the work of this Laboratory is organised through the German Association for Clinical Chemistry (Deutsche Gessellschaft für Klinische Chemie), an internationally-renowned centre, and is conducted 4 times per year. The Laboratory has received a certificate from the Centre indicating that this institution is controlling its work.
9. Provision of the mobile ultrasound apparatus necessary for measuring the volume of the thyroid gland. As elsewhere in the world, the method of palpation of the thyroid gland is considered to be unreliable and, as such, is not being used.
10. Re-evaluation of the status of iodine prophylaxis six months after the application of the new rule book. This will be carried out by establishing the iodine content by measuring the volume of the thyroid gland through ultrasound check-ups, on the basis of the value of the neo-natal TSH, and by measuring the concentration of iodine in urine in older children.
11. Improvement of the legislation concerning the control of iodine prophylaxis and the monitoring of the iodine deficit status in FBiH.
12. Education of the population through the media (TV, radio programmes, newspaper articles, and the like), as well as printing popular brochures on the importance of iodine for human body, to target immediate consumers, the population in general, medical staff, sanitary inspectors, teachers and others.

### **Sustainability**

The sustainability of this Programme in the future is quite realistic as the concept on which it is based is supported by legislation. It is worth noting that under the former

system the programme for the eradication of goitre was functioning relatively well and that it only went out of control during the war and in the post-war period. In order to restore this programme in all of its segments, it is necessary to be persistent in the near future in achieving each of the mentioned objectives, with special emphasis on educating the general public, who should know that when they are buying salt they are also taking iodine, an essential element of human nutrition. It is also necessary for the implementation of the Programme to receive genuine support from the responsible ministries in the Federation of Bosnia and Herzegovina.