Urinary iodine in IDD monitoring in Bulgaria

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1. INTRODUCTION

Bulgaria is a country with serious iodine deficiency disorders (IDD), since considerable territories with population more than 25% of the whole population are endemic.

The first national survey for evaluation of the consequences and severity of iodine deficiency was conducted in years 1956/57 [1]. As an indicator for evaluation of prevalence, distribution, and severity of IDD, goitre grade by palpation was used. The prevalence of goitre among schoolchildren was about 50-55% in endemic regions, and 19.2% in the whole country. Endemic cretinism of 3.5 % was found. The first National program for prevention of IDD in Bulgaria was started at the end of 50s. The main efforts were directed to the endemic regions. Iodine supplementation through salt iodisation and distribution of iodine tablets among high vulnerable groups were the main strategies for reduction of IDD.

As an indicator for monitoring the progress of elimination of IDD in Bulgaria, only goitre grade by palpation was used. Periodically surveys were conducted and the prevalence of goitre was reduced to about 23%. The monitoring system did not include indicators of iodine intake. No quality control on salt iodisation at different levels was applied. The preventive measures were implemented in the endemic regions only despite that high goitre grade was observed in the whole country.

After a period of suspended implementation of preventive strategies, in 1994 the National program was rebuild (Ministry of Health, National Program for Control of IDD in Bulgaria) [2]. The strategies for control of IDD in Bulgaria have included universal salt iodination of table salt with potassium iodate at 32 ppm in the whole country (not only in endemic regions) and weekly iodine supplementation of children up to 18 years and all pregnant women in endemic regions. Monitoring system at national level was created. The quality of salt iodisation at market level has been controlled. Based on the biological importance of ioduria determination as a biomarker for current iodine intake, ioduria was first introduced for monitoring of actual iodine intake in 1993 as an additional indicator of iodine status to clinical examination of goitre size.

2. MATERIAL AND METHODS

To evaluate the efficiency of the strategies for control of IDD in Bulgaria, urinary iodine determination was used before and after the implementation of iodine supplementation program. In 1994, before the beginning of universal salt iodisation a group of 217 schoolchildren, aged 6 - 17, from endemic regions was randomly selected at school basis. After implementing salt iodisation and supplementation with iodine in 1996 a national representative, school - based, cluster survey was performed. A total number of 1028 urinary samples from schoolchildren, aged 6-14 years from

both endemic and nonendemic regions nation-wide were collected. Urinary iodine concentrations were analysed at the laboratory of the National IDD Control Program by the National Centre of Hygiene, Medical Ecology and Nutrition, Sofia using the method of Dunn et al. [3].The median urinary iodine concentration was calculated, and the distribution of urinary iodine concentrations was compared with international targets for the elimination of iodine-deficiency disorders as a public health problem [4].
EPI-Info and StatSoft were used for data analyses. The results were presented as micrograms of iodine per litre urine (μg/L).

3. RESULTS

The mean and median urinary iodine concentrations from the surveys before and after the beginning of the universal salt iodisation programmes in Bulgaria are shown in Table 1. Three years after the implementation of a national programme for control and elimination of iodine-deficiency disorders through universal salt iodisation there was a clear impact on iodine status, which was evident from the urinary iodine concentration in samples of schoolchildren. The implemented strategies for elimination of iodine deficiency disorders increased significantly ($p < 0.05$) the median urinary iodine concentration of the examined representative groups in endemic and non-endemic regions (111.4 μg /L vs 65.4 μg /L). The levels of actual iodine intake was increased not only in endemic regions where both salt fortification and supplementation with iodate was used, but also in non-endemic regions with only salt iodisation strategy.

4. CONCLUSION

According to the recommended by ICCIDD/UNICEF/WHO (1994) criteria for elimination of IDD, based on frequency distribution of ioduria it could be concluded, that there is a substantial progress in iodine status of the Bulgarian population.

REFERENCES

1. I. Penchev et al., Endemic goitre in Bulgaria, Sofia 1961
2. National Program for Control of Iodine Deficiency Disorders, 1993, Ministry of Health, Bulgaria
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4. WHO. Indicators for assessing iodine deficiency disorders and their control through salt iodisation. WHO/NUT 94.6. Geneva: WHO, 1994

Table 1. Mean and median iodine concentration and distribution of urinary iodine values in 1993 and 1996

Year/region	Study group (age/years)	No of samples	Median urinary I (μg /L)	> 100 μg /L urinary I	> 50 μg /L urinary I	> 20 μg /L urinary I
				% of samples	% of samples	% of samples
1993						
Endemic regions	6 - 17	217	65.4	86	43	10
1996						
Whole country	6 - 14	1028	111.4	43.0	9.6	0.8.
Endemic regions	6 - 14	735	107.0	45.0	10.0	0.9
Non-endemic regions	6 - 14	293	119.5	36.0	7.8	0.7