ASSESSMENT REPORT ON THE RESULTS OF PREVENTION AND CURE OF IDD WITH IODIZED SALT IN 20 YEARS IN DONGYANG CITY, ZHEJIANG PROVINCE

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Abstract: Assessment of the result of prevention and cure of IDD in 20 years in Dongyang City is made, which will guide the prevention and cure in the future. Spot check of thyroid gland, iodized salt, iodine in urine and IQ of pupils aged from 8 to 10 in 19 township primary schools is carried out. The thyroid gland swelling rate is 7.78% and the illness suffering rate is 0.97%, with a decrease of 70.2% and 90% respectively as compared with the year of 1985. The eating rate of qualified iodized salt is 98.34%. Iodine in urine is 340.63 ug/L. The average IQ is 114.93±14.60. Middle and over IQ accounts for 67.09% and excellent IQ accounts for 44.06% with an increase of 27.27% and 35.90% respectively as compared with the year of 1990. The application of iodized salt in 20 years has proven the prominent result of prevention and cure of IDD. Since 1986, no cretinism case has been found. The level of iodine in urine tends to be normal and the mentality of the children has been greatly enhanced. The supply of iodized salt can basically meet the demand of the people in our city. However, continuous prevention and cure of IDD has to be carried on and the non-iodized salt has to be prevented.

Keywords: IDD, goitre, IQ, iodized salt

Since the universalization of iodized salt for the prevention and cure of IDD started in Dongyang City in May,1986, more than 20 years have passed. In order to understand the result of prevention and cure and guide the future work, we made an epidemiological investigation of the result of prevention and cure of IDD together with the Salt Administration in the city in May, 2007. The report of the investigation is as follows:

1. TARGET AND METHOD OF INVESTIGATION

1.1 Target of investigation

In accordance with <The Scheme for Examination and Assessment of Targets for the Elimination of IDD at County Levels> issued by the Health Ministry and in combination with the actual conditions in the city, children aged from 8 to 10 in 19 township primary schools are chosen as the targets to be investigated.

1.2 Indexes and method

1.2.1 The thyroid gland swelling rate: Feeling method in accordance with <the Standard for the Diagnosis and Grading of Endemic Thyroid Gland, GB16004-1995>

1.2.2 The passing rate of iodized salt: samples are taken from the salt used in the homes of pupils to be investigated, in accordance with the direct titration method specified in the Standard of GB/T5009.42-2003, and the Standard of <Edible Salt, GB5461-2000> for assessment.

1.2.3 Iodine level in urine: specimens are the middle section of urine from the pupils to be investigated, in accordance with the method of catalytic spectrophotometry with chloric

acid fermented arsenic and cerium specified in the Standard of WS/T107-1999, the suitable value of iodine in urine is 100~200ug/L.

1.2.4 The IQ level of pupils: by means of <Combined Raven's Test (CRT-C2) Atlas> (1996 Edition) revised by Professor Wang Dong of Tianjin Institute of Medical Sciences, the targets are those who are investigated for the determination of iodine in urine.

1.2.5 Iodine content in drinking water: samples are taken from the drinking water for pupils and water in wells around which schools are located.

1.3 Statistic method

Data are entered in EXCEL and the statistics are conducted with SPSS12.0 software, measurement data are based on X±S or the average figure and the digital data are based on rate or ratio.

1.4 Quality control

1.4.1 Technical training classes for the assessment of the result of prevention and cure of IDD, lectured by relevant experts from the Endemic Disease Prevention and Cure Institute under the Provincial Disease Control Center and from the Provincial Salt Administration. Trial investigations are conducted for the enhancement of assessing skill and correct application of the procedures for implement.

1.4.2 Double checks on the result of assessment and the result of determination are carried out by the assessing and investigating group co-sponsored by the Provincial Disease Control Center and the Provincial Salt Administration with a passing rate of over 95%.

2 RESULTS

2.1 Thyroid gland swelling rate

One thousand seven hundred and eighty four children aged from 8 to 10 are checked by feeling method. The thyroid gland swelling rate is 7.78% and the illness suffering rate is 0.97% with a decrease of 70.2% and 90% respectively as compared with the year of 1985. The difference of the rates is of great importance (Swelling rate:X^2=176.95, P＜0.001, illness suffering rate: X^2=3.93, P＜0.05）

Table 1 Comparison of Thyroid Gland Swelling Rate of Children Aged from 8 to 10in Dongyang City

Year	Pupils Checked	Swollen Thyroid Gland	Degree II	Swelling Rate%	Illness suffering rate %
1985	61548	16055	6087	26.09	9.9
2007	1748	136	18	7.78	0.97

2.2 Result of determination of iodized salt

Five hundred and sixty seven samples are taken from the homes of pupils to be check with 541qualified samples and 26 unqualified samples. The eating rate of qualified salt is 98.3% with an average iodine content of 30.54±4.38mg/kg.

Table 2 Result of Determination of Iodized Salt in Dongyang City

	Samples	Frequency Distribution（mg/kg）						Eating Rate of Qualified Salt （%）
		0～	5～	20～	30～	40～	50～	
Users	541	3	6	243	274	15	0	98.34

2.3 Result of determination of iodine in urine

Five hundred and seventy samples are taken with 550 of effective samples, accounting for 96.49%. The average value

of iodine in urine is340.63ug/L, among which < 100ug/L accounts for 6.73% and 100～299 ug/L accounts for 52.54%.

Table 3 Result of Determination of Iodine in Urine of Children Aged from 8 to 10 in Dongyang City

Sample	Average (ug/L)	Frequency Distribution(ug/L)							50 ug/L %	< 20ug /L %
		0～	5～	20～	50～	100～	200～	300～		
550	340.63	0	1	3	33	129	160	224	0.73	0.18

2.4 Result of determination of IQ

From 19 Schools, 547 children aged from 8 to 10 are investigated. The IQ is 114.93±14.60 among which the middle and over IQ value accounts for 67.09% and excellent and over accounts for 44.06, indicating an obvious increase as compared with the year of 1990 with an increase of 27.27% and 35.90% respectively.

Table 4 Result of Determination of IQ of Children Aged from 8 to 10 in Dongyang City

IQ	Class	1999		2007	
		Children	%	Children	%
≥130	Very Excellent	177	3.15	73	13.35
120～129	Excellent	521	9.26	168	30.71
110～119	Middle and Over	1129	20.07	126	23.03
90～109	Middle	2378	42.27	153	27.97
80～89	Middle and Lower	829	14.74	13	2.38
70～79	At Boundary	415	7.38	8	1.46
≤69	Low IQ	177	3.15	6	1.1
Total		5626	100	547	100

2.5 Result of health education

Five hundred and sixty nine copies of questionnaire are distributed to children at school age. The knowledge rate of IDD is 62.23% and the full mark rate is 17.91%. Ninety one point zero four pupils know that iodine deficiency will lead to goitre. However, 45.87% pupils do not know the fact that iodine deficiency will cause different degrees of mental damage. The rate of knowing that iodized salt is the best way to prevent IDD is only 53.43% and 90.51% of pupils know the right time to use iodized salt when cooking. Difference exists among schools. The knowing rate in several schools is comparatively low. To household wives, 108 copies of questionnaire are distributed. The knowing rate of IDD is 98.15% and the full mark rate is 10.18%.More than 95% of house wives know they should buy qualified iodized salt and know the right time to use iodized salt when cooking. But 16.87% of house wives do not know the hazard of iodine deficiency.

2.6 Result of determination of iodine in water

The epidemiological investigation of iodine in water conducted in 1990 shows that the average value of iodine in water is 0.767~55.05mg/L. At present, the drinking water for the schools mainly comes from the city water. The result of determination still shows a serious deficiency of iodine. The average value of the city water for the schools is only 6.18mg/L (Normal value is 10mg/L)

Table 5 Result of Determination of Iodine in Water in Dongyang City

Sample	City Water	Well Water	Pond Water
Average Value（mg/L）	6.18	21.96	7.76

3.CONLUSIONS

Obvious results of prevention and cure of IDD with iodine for more than 20 years have been gained. No cretinism case has been found since 1986. The thyroid gland swelling rate of children aged from 8 to 10 dropped from 26.09% in 1985 to 7.78% in 2007.

Iodized salt supplied by the city Salt Administration can basically meet the demand by the people, especially by the children aged from 8 to 10. The passing rate of iodized salt is over 95%. The iodine in urine complies with the requirement, less than 50ug/L is only 0.73%.

The prevention and cure of IDD have greatly enhanced the mentality of the children in our city. The IQ value of the people is 114.93±14.60. Middle and over IQ value accounts for 67.09% and excellent and over IQ value accounts for 44.06% with an increase of 32.65% as compared with the year of 1990. Along with the improvement of leaving standard and education quality, iodized salt used for the prevention and cure of IDD will effectively enhance the mentality of the children.

The level of iodine in the environment shows that Dongyang remains to be the region of serious iodine deficiency and that iodine content in pupils' drinking water is still low (6.18mg/L). The prevention and cure of IDD has to be consolidated. Continuous eating iodized salt is the most effective and economic way to control IDD.

The investigation among the children at school age and the house wives with questionnaire shows that the city health department should strengthen the health education and propaganda, and the education department should take the propaganda of IDD as one of the important items for health education in schools. Knowledge of the elimination of IDD should be popularized and propagated through the channel of "pupil—family—society."

During the investigation, three samples were found to be non-iodized salt. Therefore, the Salt Administration must strengthen to crack down the marketing of non-iodized salt so as to prevent the negative impact on the work of prevention and cure of IDD in our city.

REFERENCES

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