Knowledge, attitudes and practices regarding iodine among patients with hyperthyroidism in the Free State, South Africa

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Abstract

Objectives: To gather baseline information on the knowledge, attitudes and practices regarding iodine and iodised salt among patients with hyperthyroidism in the Free State.

Subjects and Setting: The study was part of a large cohort study that included the first 96 patients aged 13 years or older diagnosed with hyperthyroidism and referred to Universitas Academic Hospital in Bloemfontein, South Africa during 2005.

Methods: The patients were interviewed in their language using a structured validated questionnaire. Descriptive statistics were used for data analysis.

Results: The majority of the patients (86.9%) did not know what iodine was. Similarly, a higher percentage of patients (76.7%) were unaware of the most important or main source of iodine in the food of South Africans. Regarding knowledge of the most important harmful effect on the health of children if they did not get enough iodine, almost all of the patients (89.1%) did not know what it was. Ninety-five per cent of salt was obtained from the local shops, and only 36.1% of the patients read the labelling on the package during purchase. A very small proportion of patients (1.6%) stored salt in closed containers and away from sunlight, while about half of them (49.2%) stored salt in open containers without lids, 36.1% stored it in rigid plastic containers with holes at the top, and 13.1% stored it in the open plastic bags in which the salt was bought.

Conclusions: Patients with hyperthyroidism lacked knowledge of iodine, as well as of the storage of iodised salt, and this could have contributed to the persisting endemic goitre reported in previous studies. An aggressive awareness programme, targeting policy makers and the public, is recommended to ensure sustainable elimination of iodine deficiency disorders in South Africa.

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Introduction

Iodine is regarded as one of the most important trace elements in the human body. It is required during the synthesis of thyroid hormones, which play a determining role in the process of the early growth and development of most organs, especially the brain, in human subjects during fetal and early postnatal life.[1] Thus, iodine deficiency in a given population leads to a series of functional and developmental abnormalities, termed iodine deficiency disorders (IDD), which occur at different stages of life and include abortions, stillbirths, congenital abnormalities, cretinism, goitre and impaired mental function.[1,2]

While iodine deficiency has been reported to facilitate the development of toxic nodular goitre, iodine supplementation in iodine-deficient areas may also increase the prevalence of autoimmune thyroid disorders. For this reason, iodine-induced hyperthyroidism (IIH) is also regarded as an IDD, which may occur primarily in older people in a population that has been exposed to iodine deficiency for a long time and where severely iodine-deficient populations rapidly and excessively increase their iodine intake.[3–6] It has also been reported that IIH may occur even when the total amount of iodine intake is within the usually accepted range of 100 µg to 200 µg per day.[7]

In South Africa, voluntary iodisation of table salt at 10 to 20 ppm was introduced in 1954 to prevent and control the endemic goitre, which had been prevalent since 1927. Following this initiative, it was found, however, that there was unequal access to iodised salt and the prevalence of endemic goitre persisted in many parts of the country.[8–11] Therefore, compulsory iodisation of table salt at 40 to 60 ppm was introduced in 1995, following which remarkable improvement in both process and impact indicators of iodine deficiency and endemic goitre were reported.[12,13]

It is well documented that the sustainable elimination of IDD requires a strong will, wider awareness and cooperation among those who hold the key to the solution to this problem. For the effective implementation of any control programme, and for its success, it is essential that people's access to iodised salt be ensured.[14] There is also need to increase IDD awareness among the public in order to create demand for iodised salt and strong participation in IDD activities. This study was envisaged because of the observation by clinical staff that hyperthyroidism seemed common in rural people from the Eastern Free State, and the speculation was that this was perhaps due to iodine deficiency. Therefore, the study endeavoured to test this observation, with the aim being to assess the knowledge of patients with hyperthyroidism regarding IDD in South Africa.

Methodology

The study was conducted as part of a large cohort study, which included all patients diagnosed with hyperthyroidism aged 13 years or older referred to Universitas Academic Hospital in Bloemfontein, South Africa during 2005. A total of 61 of the cohort of 96 patients was included in the present study, resulting in a 64% response rate. Ethics approval was granted by the University of the Free State Ethics Committee (ETOVS 58/04). A letter explaining the purpose of the study and ensuring confidentiality was provided and explained to the patients in their home language. Following the standard hospital security measures, one copy of the patient's information was kept by the researcher and the second copy was placed in the patient's folder. Informed written consent was obtained from the patients and from the parents or guardians for those patients younger than 18 years.

The patients were interviewed by a dietitian during a face-to-face interview using a structured questionnaire from the 2004 National Food Consumption Survey-Fortification Baseline.[15] Permission to use this questionnaire was obtained, and the questionnaire was translated into and administered in the home language of the participants. It included information regarding the patient's knowledge, attitudes and practices regarding IDD.

The analysis of the data was carried out by the Department of Biostatistics of the University of the Free State using the SAS program (version 9). Descriptive statistics were used to summarise the results and categorical variables were summarised by frequencies and percentages.

Results

Socio-demographic status of patients

As can be seen from Table I, 50 of the 61 patients were females and 11 were males. The median age was 42 years (range 16 to 81 years). Although there were four different ethnic groups from different health districts of the Free State, most of the patients (61%) were African. The majority of the patients (57) were from the different health regions and urban areas of the Free State, three were from areas adjacent to the Free State, while two were from Lesotho, which is a country completely surrounded by South Africa. More than half (57.4%) of the patients were unemployed. The income of 66.7% of the patients ranged between R500.00 and R3 000.00, 78.7% lived in brick or concrete houses, 67.2% used their own taps, 63.9% used flush toilets and 82% used electricity.

Table I: Socio-demographic status of patients

Group	n	%
Gender		
Females	50	82
Males	11	18
Age		
16–39	29	48
40–81	32	52
Ethnic groups		
African	37	61
Coloured	7	11
White	16	26
Indian	1	2
Employment status		
Housewife by choice	3	4.9
Unemployed	35	57.4
Self-employed	2	3.3
Full-time wage earner (salary)	13	21.3
Part-time/ piece job	8	13.1
Highest level of education		
None	6	9.8
Primary school (Grade1–7)	10	16.4
Standard 6-8 (Grade 8–10)	20	32.8
Standard 9-10 (Grade 11–12)	20	32.8
Tertiary education	5	8.2
Household income per month (including wages, rent, sales, state grants)		
None	3	5.0
R100–R500	5	8.3
R501–R1 000	19	31.7
R1 001–R3 000	21	35.0
R3 001–R5 000	8	13.3
Over R5 000	2	3.3
Total	**61**	**100**

Knowledge, attitudes and practices regarding iodine

Knowledge

The majority of the patients (86.9%) indicated that they did not know what iodine is (Table II). Even those who mentioned that they knew what it is (14.1%) were not clear, because 4.9% indicated that it is a vitamin while 4.9% indicated that it is a mineral. Regarding knowledge on the main source of iodine in food consumed by the people in South Africa, a higher percentage of patients (76.7%) lacked knowledge of iodine. Few people provided a correct answer, with 8.3% indicating iodised salt and 3.3% sea food, while others mentioned sources such as dairy products, vegetables and drinking water. The majority of the patients (89.1%) did not know the most important harmful effect on the health of children if they did not get enough iodine from food. While only 4.9% were correct when they mentioned slow physical and mental growth, some indicated other effects, such as goitre, cretinism, hypothyroidism and death.

Attitudes and practices

Regardless of the fact that the patients did not know what iodine and its deficiency effects are, all of them indicated that they did not have any problem with iodine being added to salt. From the information gathered from the patients, almost all of the salt used by them (95%) was obtained from local shops, and only 36.1% of the patients had read the labelling on the package during purchase. There were very few patients (3.3%) who added more salt to their diet because it is iodised, while the rest added it according to their preferred taste. Only a small percentage (1.6%) of the patients stored salt in closed containers away from sunlight; a higher percentage (49.2%) stored salt in open containers without lids, 36.1% stored it in rigid plastic containers with holes at the top, and 13.1% stored it in the opened plastic bag in which the salt was bought.

Discussion

In general, the patients with hyperthyroidism had inadequate knowledge of iodine, the effects of deficiency and the proper storage of iodised salt. These findings are similar to those obtained in a study in the Northern Cape Province, where only 2% of the mothers gave

Table II: Responses to the knowledge, attitudes and practice questions

Responses to questions	Number of patients	
	n	%
Can you please tell me what iodine is		
Vitamin	3	4.9
Mineral	3	4.9
Micronutrient	0	0
Something in the food that we eat	0	0
Other (specify)	2	3.3
Do not know	53	86.9
Do you know what is the most important or main source of iodine in the food of the people in South Africa?		
Iodised salt/iodated salt/iodine in salt/salt	5	8.3
Fish/sea food/marine food products	2	3.3
Vegetables	0	0
Meat or meat products	0	0
Dairy products such as milk, cheese, butter	1	1.7
Drinking water	3	5.0
Other (specify)	1	1.7
Do not know	2	3.3
Do not know what iodine is	46	76.7
Can you tell me which part of the body needs iodine for its functioning?		
Thyroid gland/gland in front of the neck	6	9.8
Do not know	54	88.5
What do you think is the most important harmful effect on the health of children if they do not get enough iodine from the food that they eat?		
Slow growth	3	4.9
Goitre/enlarged thyroid gland/swollen neck	1	1.6
Brain damage or under development of the brain/low intelligence	0	0
Cretinism	0	0
Hypothyroidism (low concentration of thyroid hormones in the blood)	1	1.6
Death	1	1.6
Other (specify)	0	0
Do not know	52	89.1
Where do you usually buy or obtain the salt that is used for food in your house?		
Purchase in a shop such as general store	44	72
Agricultural coarse salt obtained from farmer, employer, cooperation or elsewhere	1	1.6
Spaza shop	14	23
Informal sector: street vendor or hawker	0	0
In bag of maize meal	0	0
Direct form salt producer	0	0
No salt in household	0	0
Would like to buy iodated salt but it is not available	0	0
Other (specify)	2	3.3
Do you read labelling on the salt package when you buy salt, to make sure the salt is iodated?		
Yes	22	36.1
No	34	55.7
Cannot read	0	0
Do not know what iodated salt is	5	8.2
Do you add more salt to your food because the salt is iodated?		
Yes	2	3.3
No	26	42.6
Do not know	0	0
Do not know what iodated salt is	33	54.1
Do you have any concerns about iodine being added to table salt?		
Yes	0	0
No	61	100
Unsure	0	0
Do not know what iodine is	0	0
In what kind of container do you store salt in the kitchen?		
Plastic bag in which the salt was bought	8	13.1
Carton box	22	36.1
Rigid plastic container with holes at the top	0	0
Open porcelain, wooden, plastic or metal container without a lid	30	49.2
Other, specify	1	1.6

the correct answer regarding the health benefits of the iodine in iodised salt.[16] Similarly, during a cross-sectional survey conducted by Jooste et al, only 15.4% of the selected adult population correctly identified iodised salt as the primary source of iodine and 16.2% knew that the thyroid gland needed iodine to function.[17] Also, in a recent national food consumption survey-food fortification baseline, 84.8% of the adult women indicated that they did not know what iodine is.[15] Lack of knowledge of iodine and of the effects of deficiency is of concern, since it is well documented that information, education and communication (IEC) are the most important components of an IDD control programme.[18] Many programmes in the past have been unsuccessful because they introduced iodine supplementation measures without educating the target group or other involved parties about the grave consequences of IDD and its non-correction. These programmes are usually met with indifference or resistance and are frequently not sustained.[19,20]

Regardless of the fact that advocacy for good public health is receiving growing global recognition, the South African situation as reflected in the present and in previous studies regarding inadequate public knowledge about iodine has also been demonstrated in India. In the district of Orissa, the proportion of respondents who considered goitre as a disease was only 34.3%, while only 4.4% knew correctly the causes of goitre and only 9.8% knew that goitre can be prevented by the iodisation of salt.[21] In the Car Nicobar districts of the Andamon and Nicobar Islands, no one had the correct knowledge of the cause of goitre and 85% of the people who brought salt samples did not know whether they were iodised or not.[22] In these areas the prevalence of IDD was reported to be high. Therefore, poor awareness could also be one of the factors contributing to the previously reported persisting iodine deficiency in some areas of South Africa.

In order to sustain the elimination of IDD, the 58th World Health Assembly urged member states to include health promotion in their control strategies, among other issues. Health promotion will ensure that the use of iodised salt becomes standard practice based on an awareness of the need for iodine in the diet to ensure physical and mental wellbeing, especially for expectant and breast-feeding mothers, infants and young children. Therefore, an aggressive campaign to make the community, health workers, traders and policy makers aware of the consequences and prevalence of IDD and the necessity for correction should be a cornerstone of an IDD control programme in South Africa. The use of local mass media could be considered during the awareness-creation campaigns, since they proved to be effective in increasing the use of iodised

salt in Turkey.[23] Community awareness and understanding of the problem is crucial, since political support for the elimination of IDD also depends on it.[2] Pandav et al have indicated that without this community awareness, politicians are unlikely to be aware or willing to act.[24] The education of health workers is a further imperative, since nongovernmental organisations (NGOs) in India have reported poor awareness of the causes, consequences and preventative measures associated with IDD, even among district officials.[14]

Although literacy rate and income were not associated with knowledge in this study, due to the small sample size, these two factors were found not to make any difference in India, where the educated group did not seem to offer any better advantage over the non-educated group as far as the use of iodised salt and knowledge of IDD as a whole were concerned.[21] However, in South Africa, the low socioeconomic group had a lower level of awareness compared to people with a higher socioeconomic status,[17] which could also be the case in the present study, considering the fact that more than half of the patients were not employed. It therefore is important that the South African government ensure people's access to iodised salt, and particular attention should be paid to the supply of adequately iodised salt to the poorer sectors of the population.

In South Africa, all table salt is iodised, but non-iodised agricultural salt is available at agricultural co-operatives, where some people or traders obtain it for domestic use. However, this practice is limited to a few geographical regions, especially in the northern part of the country, and it is clear that non-iodised salt competes with iodised salt in these regions.[11,12,13] Since most patients in this study mentioned that they bought salt without reading the label, the government should consider the iodisation of agricultural salt in order to prevent vulnerable people from gaining access to non-iodised salt, because compulsory iodisation does not apply to agricultural salt that is used for animal consumption.

Conclusions and recommendations

This study shows that patients with hyperthyroidism lack knowledge of IDD, which could possibly have contributed to the endemic goitre that has previously been reported in some areas of the country. There has been advocacy in the past, but the findings of the present study point to the need for "re-advocacy", which underlines the need for continuous political commitment and awareness[25] to ensure the sustainable elimination of IDD in South Africa, with more emphasis being placed on the economic benefits of IDD control. Education should take place at all levels and should include politicians and decision makers, health workers, workers in the salt trade, citizen groups and the iodine-deficient community. A nationwide effort to promote iodised salt and to provide women of childbearing age with advice on dietary sources of iodine should also be implemented by community health workers, nutritionists and other extension workers.

Since it has been stated that political support for the elimination of IDD depends on community awareness and understanding of the problem,[2] a strong will, wider awareness and the cooperation of communities should be taken as the key factors that are required globally.[14] The IDD committee must first be strengthened, and members could be assigned different areas of responsibility, such as assessment of progress, enforcement of legislation, as well as education and communication. The present IEC materials should be evaluated to identify reasons for their small effectiveness, and then be improved. There should be a quarterly national campaign to inform policy makers and the public about IDD and the use of iodised salt, emphasising its benefit for the development and learning ability of children. Information on the proper methods of salt storage at household level should be included in the messages. Furthermore, the IDD messages should be included in the curriculum of primary schools, secondary schools, high schools, colleges and universities.

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Conflict of interest

None declared

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