

Goitre Prevalence and the Proportion of the Households Consuming Iodised Salt in a Rural Area, Ankara Turkey

YENİCE İLKOKULU ÖĞRENCİLERİNDE GUATR PREVELANSI VE EVLERDE İYOTLU TUZ TÜKETME SIKLIĞI, ANKARA

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SUMMARY

This study was performed in primary school children and the households of Yenice village, Ankara to determine to goitre prevalence and the proportion of households consuming iodised salt. Yenice Primary School consists of five classes including 126 pupils 6-11 years aged of whom all were examined. The goitre prevalence (according to WHO criteria) in the study group was found to be 20.6%, while the goitre prevalence of grade 2 (visible goiter) was determined at 2.4%. Nutritional status and school performance of the pupils were assessed, but no statistical relationship was observed between goitre and physical growth and school performance.

160 household members were interviewed and 32.1% of the households were found to be consuming iodised salt. However 3.1% of the households were determined as consuming iodised salt. Some factors concerning the consumption of iodised salt on health was found to be an important factor on the consumption of iodised salt. 44.1% of women were determined to be consuming iodised salt by knowing its effect on health, while 84.6% of the women were defined as not consuming iodised salt due to lack of knowledge. Being aware of the relationship between goitre and consumption of iodised salt was also important.

Key Words: Goitre prevalence, school children, consumption of iodised salt

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ÖZET

Bu araştırma, Yenice İlkokulu öğrencilerinde guatr prevalansını saptamak ve bölgede evlerde tüketilen iyotlu tuz oranını belirlemek amacıyla Kasım-Aralık 1994 tarihinde gerçekleştirilmiştir. Beş sınıftan oluşan Yenice İlkokulu'nda eğitim gören 6-11 yaş grubundaki 126 öğrencide, Dünya Sağlık Örgütü tarafından belirlenen kriterlere göre inspeksiyon ve palpasyonla saptanan guatr oranı %20.6'dır. İncelenen grupta ikinci derece guatr olarak tanımladığımız görünen guatr oranı ise %2.4 olarak saptanmıştır. Öğrencilerde guatr görülme durumu ile ilgili olabilecek bazı faktörlerden öğrencilerin fiziksel büyüme durumları ve okul başarı durumları araştırılmış, ancak guatr görülme durumu ile bu değişkenler arasında istatistiksel olarak anlamlı bir ilişki saptanamamıştır.

Araştırmada evlerde tüketilen iyotlu tuz oranını belirlemek amacıyla bölgede bulunan 160 hanede yaşayan kadınlarla görüşülmüştür. Bölgede %23.1 evde iyotlu tuz tüketildiği gözlenirken %3.1 evin sadece iyotlu tuz tükettiği saptanmıştır. İyotlu tuz tüketimine etkili olabilecek bazı faktörlerin araştırılmasında, kadınların iyotlu tuzun sağlık üzerine olan etkilerini bilme durumunun iyotlu tuz tüketimi üzerine önemli bir faktör olduğu belirlenmiştir. Kadınların %44.1'i iyotlu tuzun yararlı etkisini bilerek kullanırlarken %84.6'sı bu olumlu etkiyi bilmedikleri için iyotlu tuz tüketmemektedirler. Ayrıca araştırmada guatr görülme durumu ile iyotlu tuz tüketimi arasındaki ilişkide istatistiksel açıdan anlamlı olarak saptanmıştır.

Anahtar Kelimeler: Guatr prevalansı, ilkokul öğrencileri, evlerde tuz tüketimi

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Iodine is a chemical element. Human needs iodine to make thyroid hormones. These hormones are produced by the thyroid gland. After manufacture in the thyroid gland, thyroid hormones travel in the blood and control many chemical process in different parts of the

body. These hormones are essential for normal development and function of the brain and nervous system and for maintenance of body heat and energy (1). The healthy adult human body contains 15-20 mg of iodine of which about 70-80% is found in the thyroid gland. Thus, the pool of iodine is concentrated mainly in the thyroid (1,2). When people do not have enough iodine, they can't make enough thyroid hormone. This deficiency of iodine has several important health consequences which together are called "iodine deficiency disorders" or IDD. These consequences are: Goitre at all ages, endemic cretinism, characterized most commonly by mental deficiency, deaf mutism and spastic diplegia and lesser degrees of neurological defect related to foetal iodine deficiency, impaired mental function in children and adults associated with reduced levels of circulating thyroxine, increased stillbirths, perinatal and infant mortality (2-6).

Iodine deficiency also affects the socio-economic development of a community in two ways. First, the people are mentally slower and less vigorous. Secondly, in most of these areas, agriculture is the most important economic activity and domestic animals will be smaller and produce less meat, eggs and wool. They also have more abortions and are frequently sterile (1,2,4,5).

Recent evidence indicates a wide spectrum of disorders resulting from severe iodine deficiency which puts at risk more than 1.5 billion people in over 70 countries with approximately 710 million in Asia, 60 million in Latin America, 227 million in Africa and 20-30 million in Europe. Of these 650 million have goitre, the most obvious sign of inadequate intake and at least 6 million have cretinism (1,2,10). The iodine deficiency disorders also constitute a major public health problem in Turkey. According to the criteria of the European Thyroid Association, there is not any geographical region free of goitre problem in Turkey (7).

There are two main ways of conducting descriptive epidemiological surveys, one being a study of selected populations such as students or soldiers and another being a study of a sample of the whole village or town. Each has its own advantages. Schools are accessible and little preparation is needed. The survey could be carried out rapidly and more importantly the picture will be that of the present status as the study of adults might show the past situation (3).

As it is known very well, the goal of the World Summit for Children for the 2000 is "The virtual elimination of iodine deficiency disorders". In February 1994, the WHO/UNICEF Joint Committee adopted the following Mid-Decade Goal "To achieve iodization of all salt for human and animal consumption-UNIVERSAL SALT IODIZATION- in all countries where iodine deficiency disorders are a public health problem" (2). Turkey has

also aimed to eliminate IDD problem in the whole country by the year 2000 as adopted by the World Summit Children in 1990 and in the World Declaration and Plan of Action for Nutrition in International Conference on nutrition in 1992, Rome and a programme has been started. The indicator for measuring the effectiveness and sustainability of IDD control program is the proportion of households consuming adequately iodised salt in areas known to be at high risk of iodine deficiency disorders (1,3).

Thus, to determine the magnitude of the problem in a rural area of Ankara, to determine the proportion of households consuming iodised salt in this village, (To date, we have no available data about household consumption in Turkey) and to find out some causes for consuming iodised or noniodized salt in this area this survey was carried out.

MATERIAL AND METHOD

1- Study Population: The study was carried out at the households of Yenice village and among Yenice Primary School's pupils.

Some of the health indicators of the study area were as follows (8).

Crude death rate: 4.02%0.	Infant Mortality rate: 65.7%0
Crude birth rate: 22.0%0.	Maternal Mortality rate: 0

Total number of the households in the village were 160 in November, 1994. All households were included in the survey. Yenice primary school consists of 5 classes including 126 pupils of whom all were examined during the survey.

Variables: Dependent variables were; goitre prevalence in 6-11 years aged children and the proportion of the households consuming iodised salt, while independent variables were selected as children's age, sex, nutritional status, school performance (according to their grades at school). The target group on the assessment of the proportion of the households consuming iodised salt was women at the households. Data about their age, occupation, educational status of the women and their husbands, status of iodised salt consumption by observation of salt package at the household, knowledge of the women about the benefits of consuming iodised salt on health, knowledge of the women about the consequences of consuming unionised salt were collected. Status of iodised salt sale in the markets of the village were also investigated.

There are five indicators that could be used in order to detect IDD, however only two are commonly used due to the fact that they are not costly as other methods and are routinely available. These are goitre surveys and urinary iodine level. In this study, goitre prevalence has been estimated by inspection and palpation according to WHO criteria which are described below (1,2).

Grade 0: No palpable or visible goitre

Grade 1: A mass in the neck that is consistent with an enlarged thyroid that is palpable but not visible when the neck is in the normal position.

Grade 2: A swelling in the neck that is visible when the neck is in a normal position and is consistent with an enlarged thyroid when the neck is palpated.

Constraints related to survey:

Goitre prevalence was determined by palpation and observation of the thyroid gland which could cause inter and intra-observer error. However researchers were not able to test urinary iodine level which is strongly advised to be measured in epidemiological surveys (3,9). Due to the lack of kits for checking salt iodised with potassium iodide, quality control for iodised salt could not be done either.

RESULTS

In the first part of the study, GOITRE PREVALENCE has been determined. As is seen in Table 1, goitre prevalence was determined as 20.6% in the study group.

Nutritional status of the pupils were assessed by NCHS standards using Z-score. 97% of the students were determined above -2SD (according to weight for height, height for age). No statistical significance was observed between goitre and physical growth of the pupils.

School performance of the children were evaluated according to the grades obtained from their teachers. 11.1% of the pupils' school performance was indi-

Table 1. Goitre prevalence in Yenice Primary School's pupils (November, 1994).

Grade	Goitre	
	N	%
0	100	79.2
1	23	18.2
2	3	2.4
Total	126	100.0

Table 2. The proportion of the households consuming iodised salt, (November, 1994).

Consumed	Iodised Salt	N	%
	Yes	37	23.1
	No	123	76.9
	Total	160	100.0

Table 3. Types of the salt consumed and factors effecting selection (Yenice, 1994).

Selection Criteria	N	%
Consuming package salt (iodized + noniodized) for taste and health and consuming rock salt for its cheapness	26	16.3
Consuming package salt (iodized + noniodized) for health	11	6.9
Consuming rock salt for its cheapness	10	6.3
Without due attention	19	11.9
Accustomed to consume package + rock salt	71	44.3
Consuming package salt (iodized + noniodized) for its good appearance	4	2.4
Total	160	100.0

cated as insufficient. This ratio was found to be 11.5% children who had goitre and 9.0% among normal children.

160 household members were interviewed. 60.0 % of the women's ages were between 30-49, 77.5% of the women and 68.1 %of their husband's educational status were primary school level. The proportion of the households consuming iodised salt is given in Table 2.

23.1% of the households were found to be consuming iodised salt. However 3.1% of the households were determined as consuming only iodised salt. 20.0% were found to be consuming iodised salt together with other types of salt, 14.4% Package refined salt (iodized + non-iodized) and crude salt (rock salt) and 5.6% package salt (iodized + non-iodized). In the study area, the proportion consuming only rock salt was determined 8.1% while rock salt + non-iodized package salt were determined 56.9%.

The reasons for consuming these types of salt are shown in Table 3.

In Yenice village, there were 4 markets. Only 6 packages of iodised salt were observed in two markets. However, village inhabitants expressed that most of the time, they did their shopping from town centre, Çubuk.

Educational status of the women and their husbands in relation to consumption of iodised salt was investigated, but the relationship was not found to be statistically significant. Meanwhile, being aware of the importance of iodised salt consumed on health was found to be an important factor on consuming iodised salt. 44.1% of women were determined as consuming iodised salt by knowing its effect on health while 84.6% of the women were determined as not consuming io-

Table 4. Knowledge on the relationship between goitre and iodised salt consumed, Yenice, 1994.

	Iodised salt Consumed		Non-iodised salt Consumed		Total	
	N	%	N	%	N	%
Aware of the effect of iodised salt on goitre	15	39.5	23	60.5	38	23.8
Unaware of the effect of iodised salt on goitre	22	18.0	100	82.0	122	76.3
Total	37	23.1	123	76.9	160	100.0

SD= 1 Chi= 77.94 p= 0.006 p< 0.005

dised salt due to lack of knowledge. The knowledge about the effects of iodised salt on health was determined as follows;

64.3% of the women expressed that iodised salt would treat goitre, 7.0% expressed that it would prevent mental retardation and 25.0% expressed that it could prevent goitre.

Being aware of the relationship between goitre and iodised salt consumed, was found to be statistically significant as shown in Table 4.

DISCUSSION

Goitre is the most obvious manifestation of IDD. If the gland enlarges until it is visible, it is called a goitre. If the prevalence of goitre in a region is up to 4% it is not IDD related, but if it is more than 4%, it is IDD base (2). The goitre prevalence in the study group was found to be 20.6%. The total goitre prevalence in Turkey has been determined as 30.5% by a mass screening survey performed in 73,700 subjects between 1980 and 1988 and following the previous criteria of WHO and grading goitres in four categories (7). The goitre prevalence of grade 2,3 and 4 are 4.38%, 1.85% and 0.54% respectively. So large goitre prevalence rate is 2.4%, since this ratio was also found to be 2.4% in the study group. In another survey, conducted among school age children which is the target group of monitoring IDD control programme goitre prevalence was determined at 36.0% by palpation and observation of the thyroid gland (10).

In areas with severe and moderate iodine deficiency, inadequate iodine impairs the development of the brain of the foetus and the young child. Children in areas where iodine deficiency is common, perform less well in tests of psychomotor and cognitive performance. However, in this survey no statistically significant relationship was observed between goitre

and school performance and physical growth of the pupils.

The iodisation of all salt for human and animal consumption is the most effective and sustainable way of eliminating iodine deficiency disorders due to the following reasons (1-4)

* Everyone needs salt usually in fairly constant daily amounts.

* The amount of salt consumption by individuals is more or less constant

* The consumption of salt does not depend on the economic status of individuals.

* It requires simple technology.

* Supervision and monitoring is easily realisable

* Added iodine does not affect the appearance smell or the taste of salt.

* Increasing the concentration of iodine has no adverse effect on the consumer.

* Additional costs due to the addition of iodine to salt is negligible.

* The experience of other countries in the last decades confirms it as a viable and efficient method.

As iodised salt is usually the most satisfactory means of intervention, like many countries, Turkey has agreed to use universal salt iodisation as a method of supplementation to prevent and control IDD. Iodised salt in Turkey is only produced by the private sector and not by state organisations and is not imported. A legislation has been existed since 1968 for iodisation of salt but the proportion of iodised salt by five major salt producers was found to be 37.0% (as of the end of March 1995). However in this study, the proportion of the households consuming iodised salt was determined 23.1% while 3.1% of the households were determined as consuming only iodised salt. 20.0% were found to be consuming iodised salt together with other types of salt.

A collaboration programme has been decided to eliminate health problems arising from iodine deficiency by universal salt iodization in Turkey, between the general directorate of Maternal and Child Health and Family Planning of the Ministry of Health and UNICEF. The aim of this programme is to iodise all salt and to educate the public for the use of iodised salt. Through this programme, important measures were to be taken such as education, salt iodisation, evaluation and monitoring. For health education, radio and TV programmes and posters have been prepared and used. Salt companies have been regularly reporting their monthly salt and iodised salt production and the region of the country they distribute salt to.

Although this study was conducted in a small area, the high prevalence of goitre and the low proportion of households consuming iodised salt shows that in addition to the programme implemented jointly by the Ministry of Health and UNICEF, "IDD Elimination and Salt Iodisation", the salt industry itself should also be encouraged to make legitimate and responsible health claims for properly iodised salt. Hybrid approaches involving both the private and the public sector in marketing and monitoring of iodised salt usage could be considered.

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