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Factors Affecting on Thyroid Cancer Incidence in Residentials of South-Eastern in Iran

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Abstract: It has been hypothesized that changes in thyroid cancer incidence is due to the genetic, environmental factors and radiation. This study investigated an important aetiological cause occurrence of thyroid cancer in residentials of south-eastern in Iran. Affected factors on thyroid cancer incidence has been researched by questionnaire in 100 families of two villages of Sistan and Balouchestan of Iran in 2007. These consist of radioactivity of drinking water, radioactivity of consumed nutrient and genetical factors. The questions of questionnaire are about consumed animal or plant food, happened thyroid cancer in near or far family and occurred thyroid cancer in individual. The questions in the questionnaire have been completed by replying the families. The results showed that radioactivity of drinking water, radioactivity of consumed food does not affect thyroid cancer occurrence, but genetical situation of families would take a part on thyroid cancer in these regions. The statistic method of Fisher Exact Test has been applied to confirm the results.

Key words: Thyroid cancer, incidence, radioactivity, drinking water, food, genetic factor, age

INTRODUCTION

Thyroid Cancer refers to a cancerous growth in the thyroid gland.. The Thyroid cancer data in the world show that it occurs 1% in 1000 people in England. The occurrence in other countries is more than England. Iceland country is 15% per 1000 people. Thyroid Cancer is 3.59% in female and 1.17% in male in Iran. There are now more than 200,000 patients in the U.S. living with thyroid cancer and incidence has increased by over 20% in the last 5 years.

Evidence is growing that in addition to genetic disposition (Sprague *et al*., 2008), chronic goiter (Truong, 2007); nutritional imbalances (Dogru, 2007), hormonal and psychological factors (Nakachi *et al*., 2008), environmental challenges (Larson *et al*., 2007) and other immune suppressive factors (Nggada, 2008) increase the risk of thyroid cancer.

According to researches various factors such as nutrient and behaviour affect thyroid cancer in different parts (Drozdovitch *et al*., 2008). Radioactive test in atmosphere caused agricultural yields and nutrient to be polluted. Scientists attention and general public have been related to nuclear explosions and radioactive accidents in recent years about radioactive material and radioactive nutrient. The scientists showed that low doses of radioactivity could cause cancer in human (Albores-Saavedra *et al*., 2007), but those who confronted with high concentration of radioactive iodine would probably overcome thyroid cancer (Larson *et al*., 2007). The radioactive iodine component might occur thyroid cancer. The research revealed absorbed dose of radiation in Saravan city is more than Zaboul city in Iran. It is possible to prevent or decrease the thyroid cancer risk by screening and detection case. These two factors should be done completely and especially detect cancer disease in equal or less than 2 years baby. Context: European studies have shown that use of routine screening

for detection of thyroid cancer in people increases the health of them and may improve patient outcomes The study by Cardis *et al.* (2005) has provided provocative information on the risk of radiation induced thyroid cancer and on the modifying role of diets deficient in stable iodine of administering iodine supplements months after the exposure has occurred. It is aim of present investigation to find either environmental or genetic factors of thyroid cancer occurrence in the villages residents of Sistan and Balouchestan of Iran. This research could prevent or decrease the thyroid cancer problem in this region.

MATERIALS AND METHODS

Sectional description has been used for this research. Five villages situated in the south eastern region, in Sistan and Blouchestan province of Iran have been chosen as a place for investigation on 100 families in 2007. Families consist of 4-6 people in which it has averagely five individuals. The branches method has been applied for sampling, depend upon its population. It has been 25 branches. Then, for completing questions in each questionnaire, the experienced people have gone to the house for asking. These questions consist of daily nutrient such as cruciferous vegetables, consumption of butter, cheese, consumption of freshwater fish, seafood, fruits, raw vegetables, mixed raw vegetables and thyroid cancer occurrence in his/her near or far family and thyroid cancer occurrence in herself/himself. The concentration of radioactivity in water supply of drinking water and mentioned food materials has been experimented by Gamma counting set. The characteristics of the gamma counting component were as follows: Serial No. GM1 8335 S 307, counting system model: Automatic Gamma Manufacturer: KONTRON. The Fisher Exact Test has used to confirm them. It has supposed that other factors affect thyroid cancer be considered.

RESULTS

According to Table 1, 7% of individuals are up to 15 years, 40% in 16-30 years; 26% in 31-45 years old and 27% in more than 46 years. They are 85% male and 15% female in which 62 and 38% are married and single, respectively. Their job are 28% as farmers, 12% as household, 7% as storeman, 14% as workless, 15% as miscellaneous and 34% as pupils (Table 2). The research reveals that the 10% of individuals has thyroid cancer in which 9% thyroid cancer lives in Zaboul region and 1% thyroid cancer in Saravan region. Their job are 4% farmers; 2% household; 1% workless and 1% any job, 1% storeman and 1% pupil.

The thyroid cancer have not occurred in individuals, although 14% of their far or near families have thyroid cancer. The thyroid cancer have also not occurred in individuals, 76% of people have not thyroid cancer in their far or near families. Five percent thyroid cancer individuals have thyroid cancer

Table 1: Biological condition and frequency of age

Biological condition	Age (year)	Frequency (%)
Baby and teenager	0-15	7
Young	16-30	40
Mid age	31-45	26
Old man	46	27

Table 2: Type and frequency of job

Job	Frequency (%)
Farmer	28
Household	12
Storeman	7
No job	14
Workless	15
Pupil	34

Table 3: Thyroid cancer in individuals and thyroid cancer in far or near family

Position	With thyroid cancer in individual (%)	Without thyroid cancer in individual (%)	Total (%)
With thyroid cancer in far or near family	5	14	19
Without thyroid cancer in far or near family	5	76	81
Total	10	90	100

Table 4: Thyroid cancer in individuals and eating animal food

Position	Individual with thyroid cancer (%)	Individual without thyroid cancer (%)	Total (%)
Eating food by individuals	2	2	4
No eating food by individuals	8	88	96
Total	10	90	100

in their far or near families. Five percent of far or near families of individuals have not thyroid cancer, but five percent of individuals have it (Table 3). Eight percent of individuals consumed the animal food such as milk, cheese and yoghurt and have got thyroid cancer. The 88% individuals state to have thyroid cancer, in spite of them does not eat animal food. Two percent of individuals does not consume animal products but have thyroid cancer. Two percent of individuals does not consume animal food and does not have thyroid cancer (Table 4). Four percent of individuals does not eat root food such as cabbage. Stable iodine is available in drinking water of Zaboul and Saravan. The Fisher Exact Test on questionnaires data is tested.

DISCUSSION

Age of individuals is an important factor to happen thyroid cancer All these factors are researched by questionnaire. The results reveal that thyroid cancer is not occurred by radioactivity of drinking water and food materials, because of too less radioactivity in drinking water and food materials to occur thyroid cancer. Only genetical factor will affect the thyroid cancer. The Fisher Exact Test show thyroid cancer can be occurred by genetical factor.

The results also show age of individuals affects thyroid cancer (Nakachi *et al*., 2008). The peak point of thyroid cancer in male in this province is 50 years and in female is 80 years. The incidence rate of thyroid cancer is lowest level either in male and female. Although data of Zahedan health center shows that thyroid cancer is observed in early people in less than 27 years, but based on this research, thyroid cancer is occurred from 27 to 77 years old. Thyroid cancer in male and female is 78 and 22% respectively. The incidence of cancer in male is more than female. It is less than 1% in male and is the same amount in female until 19 years old. This research also shows thyroid cancer is not observed in male and female until 5 years old. The thyroid cancer is 4% and 6% in higher and lower 50 years old, respectively. The peak of thyroid cancer occurrence is from 27 to 50 years old in both of sex. The young individuals with thyroid cancer are among 27-50 years old. The old sexes are engaged in farm. They probably resist to ionizing radiation than teenager (Truong *et al*., 2007) and so thyroid cancer is less in them. The individuals age with thyroid cancer in a place is different from other parts.

Factors of radioactivity in water supply of drinking water, food material and also genetic are considered for thyroid cancer occurrence in this region. It is proved the effect of biological factors due to environmental radiation could increase among general public (Uhry *et al*., 2007; Ron, 2007; Frentzel-Beyme and Helmert, 2000). The people who have thyroid cancer are married. This also shows the people with thyroid cancer may not get thyroid cancer by environmental ionizing radiation in these regions. The risk rate of thyroid cancer with I-131 or components in comparison to get nonionizing radiation is less (Smailyte *et al*., 2006). Radiation distribution by I-131 in thyroid gland is step by step. It takes one month to distribute in thyroid gland. This time is enough to repair DNA. In addition, distribution by I-131 into thyroid gland and beta particle emitted energy are not probably steady state

to thyroid gland. It causes less risk relative to uniform distribution. This research shows thyroid cancer in individuals have related to thyroid cancer in their far or near family, so the thyroid cancer is hereditary. On the other hand, the food materials does not contribute in thyroid cancer in this region. It is also proved that dietary patterns of fruits, raw vegetables and mixed raw vegetables and fruits, led to a reduced risk (Markaki *et al*., 2003). The studies shows that stable iodine in drinking water are effective in getting thyroid cancer (Dogru *et al*., 2005). This research shows stable iodine in drinking water are sufficient to exist thyroid cancer.

Two percent of people eat animal food and get thyroid cancer (Table 4). The percentage of thyroid cancer comparison in which individuals consume plant or animal food pretend the food material, stable iodine in drinking water and animal plant food materials have not played a role in happening thyroid cancer in this area. On the contrary, 5% of far or near families of individuals with thyroid cancer may be a reason of hereditary occurrence. Of course, it is possible that far or near families get thyroid cancer but there is no thyroid cancer occurrence in individuals. However,. genetic factors eventually cause thyroid cancer (Gimm, 2001). Interpretation is somewhat problematic, however, because the risk from exposure to radionuclides of Chernobyl accidents appeared concentrated among people with more than 50 years residing in iodine-sufficient areas (Davis *et al*., 2004; Albores-Saavedra *et al*., 2007; Ron, 2007). Conceivably, the elevated radiation risk reflects an interaction with dysfunctional thyroid gland; this result tempers conclusions with regard to similarities or dissimilarities in risk observed in other studies of children with normal glands. The thyroid gland of children proliferates more rapidly than the adult gland and it is believed that this rapid cell growth is the primary reason why radiation effects are so apparent after exposures in childhood and not among adults (Morris *et al*., 2008; Nggada and Adelusola, 2008). The thyroid glands of children living on areas of iodine deficiency are also more active and undergo more cellular proliferation and growth than the areas of iodine sufficiency and it may be that enhanced cellular activity is related to the enhanced risk observed. Thus, the growing thyroid glands of children coupled with an abnormal growth potential related to iodine deficiency may enhance the expression of cellular damage induced by radiation (Cardis *et al*., 2005). It is then noteworthy that children who may have had normal functioning thyroid glands because of residing in the area of highest iodine soil content and who subsequently took potassium iodide supplements were not at a statistically significantly increased risk of developing thyroid cancer after radiation exposure.

There are less radioactivity in drinking water and food material. So it can not be contributed in getting thyroid cancer in person. Radioactivity of drinking water and food material is very less, so the health of consumers is not threaten by these (Ivanov *et al*., 2007). However, it has been emphasized that no radioactivity in drinking water and daily food material will be risked the life of people in this region. The results support that the radioactivity level in the water supply is not one of the risk factors of the formation of the thyroid tissue in the eastern part of Sistanand and Blouchestan. It is possible the radioactivity can be remained in surface of water and be changed to non cancer type during chemical reaction. The pollution of radio iodine in which cause thyroid cancer due to nutrient and water is less; because less people get the illness in Zaboul and Saravan..

While the research shows that the thyroid cancer in Zaboul is more than Saravan zone, the adsorbed dose in Saravan is more than Zaboul zone. This case shows that the thyroid cancer in individual can be gotten through the other way different from these sources (Lin *et al*., 2005). The research also shows that radioactive iodine concentration is more in Saravan drinking water than in Zaboul zone. Its amount is less than the range which has been determined by ICRP. It is safe and there is not any problem about drinking water and food material. Oral potassium iodate is recommended: 30 mg of iodate a month or 8 mg every two weeks. Iodized oil has been recommended by some authors, as well as a combination of iodine and sugar and the iodation of drinking water (Rovere and Awada, 2008); these are in addition to the proposed methods of opening up areas by new (Nggada and

Adelusola, 2008). There were some limitation in fulfilling this research: Some of villages families did not answer to the questions sometimes. The families did not know some questions in questionnaire correctly. It was difficult to ask female some questions. Some of the houses were closed for asking the questions in questionnaire.

CONCLUSION

It is concluded that the thyroid cancer can be occurred by genetic factors such as family wedding in this region. It causes more problems than ionizing radiation which exist less in drinking water and nutrient material in this region.

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