

THE MACROSCOPIC EXAMINATION OF THYROID GLAND OF THE REPUBLIC SAKHA (YAKUTIA) ADULT POPULATION

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The authors submitted results of the macroscopic study of thyroid gland of native and non-native population of the Sakha Republic (Yakutia). Absolute and relative differences in size and weight parameters of thyroid gland in men depending on ethnicity are established.

Keywords: thyroid gland, morphometry, size and weight parameters.

INTRODUCTION

Nowadays the humanity of the planet faces serious environmental problems adversely affecting end ecology, especially the stability of the chemical composition of the body, which is one of the most important and obligatory condition for its normal functioning. Since the majority of regions of the Russian Federation is characterized by deficiency of iodine in water and soil, the diseases associated with deficiency of the trace element, are a serious medical and social problems as they influence not only the health of the population, but also the intellectual level of the society [9, 5,3].

Deficiency of iodine in nature results in the transformation of the thymus thyroid gland (TG) which is characterized by proliferative changes of individual elements in the system of tireon, accompanied by a violation of normal hemotissue relations providing optimal tropics, differentiation and functional viability of specialized structures [7,11].

For the last years the Republic of Sakha (Yakutia) has been a territory with a significant deficiency of iodine in nature and is characterized by a high prevalence of thyroid disease in children and adults [2,4,8,10]. In addition to the deficiency of iodine and other trace elements in the environment, the organism as a whole and, in particular, the thyroid is affected by other specific factors of Yakutia: extreme temperature and light regimes, evident seasonal climate anomalies in the geomagnetic field [1].

The aim of the study was to investigate the macroscopic parameters of the thyroid gland of indigenous and non indigenous adults in the endemic region for example, Yakutsk, Sakha Republic (Yakutia).

MATERIALS AND METHODS

The City Bureau of Forensic Medicine and Pathology Department of the Republican Hospital number 1- NCM investigated 53 thyroid gland (TG) of males who died suddenly as a result of coercive actions in Yakutsk, aged 20 - 70 years old, including 7 (13.2 %) aged 20-29 years, 30 - 39 years old - 8 (15.1%), 40 - 49 years old - 10 (18.8 %), 50 - 59 years old - 10 (18, 8%), 60 - 69 years old - 10 (18.8%), 70 years and older - 8 (15.1%). They were identified into two groups: those indigenous (Yakutia) - 21 (39.6 %), newcomers (Russian, Tatar, Chuvash) - 32 (60.3 %). Autopsies were performed during the first 12-24 hours after the death. Information about the material was obtained from autopsy. According to reports, the males were not registered at endocrinologists. The macroscopic description of the thyroid gland (a common look-and- cut), and the linear dimensions of both lobes (length, width, thickness) were the object of the study. We estimated absolute mass (AM) (r) and relative (RM) of the thyroid gland (%) were used in the calculation of formula [6]:

$$RM = \frac{AM_{thyroid}}{BW} \times 100\%$$

RESULTS AND DISCUSSION

At the surveyed groups on gross examination the thyroid gland is located on the anterior surface of the trachea. All of the studied cancer had two-lobe structure connected by an isthmus. The thyroid

gland was surrounded by the visceral fascia of the neck and is enclosed in a fibrous capsule. Breast tissue to the touch had a mild elastic consistency on the cut surface of fine-grained, reddish - brown color.

Since the dimensions of the thyroid gland are the key indicators of morphology and function of the state, we have studied the linear parameters and the absolute and relative weight of the thyroid gland in indigenous and migrant populations in different age groups. Thus, we studied medium-sized height, width and thickness of both the lobes of thyroid (cm), and found out depending on the age we found out that the height of the left lobe of the thyroid at the age of 20-29 , 40-49 , 50-59 , 70 years and older of indigenous population was 1.2-1.4 times less than the newcomers. While, the ages of non indigenous population was 30-39 and 60-69 come population is 1.2 times lower than the native population (Table 1). Research of right lobe of thyroid height showed a similar trend in the age groups. The indigenous population , in the age of 20-29 , 40-49 , 50-59 , 70 and older the right lobe of thyroid height of 1.08 - 1.2 times was less than in non-aboriginal population. Non indigenous population at the age of 30-39 and 60-69 was 1.0-1.1 times less than indigenous.

In the study of the transverse dimension of performance shares thyroid revealed that the width of the left lobe of the thyroid gland in the indigenous population less than that of the alien : the age of 20-29 and 50-59 in 1.1 times, 40-49 in 1.03 times , 70 years and older 1.2 times . While at the age of 30-39 and 60-69 width of left lobe of thyroid in non indigenous population is 1.1 and 1.0 times less than in the native population. Width of right lobe of thyroid in the indigenous population in all age groups was less than in newcomers.

Anteroposterior size indicators of thyroid in native population also had minor differences in comparison with the second group. Thus, thickness of thyroid in non- indigenous population in the age of 20-29 and 30-39 was 1.3 and 1.1 times less than that in native population. In other age periods of the thickness of the thyroid in the indigenous population was less than in non- indigenous population.

The comparative analysis of thyroid mass, depending on ethnicity, showed (Fig. 1, 2), that in the age of 20-29 years the absolute weight of thyroid gland in the indigenous population was in 1.3 times lower than in the non- indigenous population, while the relative thyroid weight in the natives was in 1.2 times bigger. At the age of 30-39 years, the absolute and relative weights were lower in non- indigenous population (1.2 and 1.1 times, respectively). The following age groups did not have the same trend in quantitative terms of the absolute and relative thyroid weight, according to ethnicity. So in the indigenous population there is a tendency to an increase in thyroid absolute mass compared with the non-indigenous, and in those aged 50-59 years in 1.2 times the relative mass of the thyroid gland is larger. At the age of 70 years and older absolute and relative masses of thyroid gland were less than in non- indigenous populations (1.8 and 1.2 times, respectively).

CONCLUSION:

As a result of morphometric study the quantitative index of the thyroid gland, depends on age and ethnicity. It was revealed that the indigenous population of the dimensional parameters height of the right and the left lobe of the transverse size of the share of the thyroid at the age periods of 20-29 , 40-49 , 50-59 , 70 and are less than in non- indigenous population. Indicators of anteroposterior size of the thyroid in non-aboriginal population in the age of 20-29, 30-39 are less than the native, in the other age groups, there is a tendency to increase, in comparison with the indigenous.

Comparative analysis of thyroid mass in dependence of ethnicity showed differences in parameters of thyroid absolute and relative masses which depend on age. At the age of 20-29, 30-39, absolute and relative weight of the thyroid gland is less than in the natives, whereas at the age of 40-49, 50-59 and 60-69 years there is a tendency of a slight increase in the absolute mass, and there is a reduction at the age of 50-59, 60-69 years and the increase of the relative weight of the thyroid in the indigenous population, compared with non- indigenous population. At the age of 70 and

older, thyroid weight in non- indigenous population is slightly larger than in the indigenous.

Taking into consideration the fact that thyroid performs an essential role in the adaptive reactions of the organism, the results can be the basis for further histological examination of the thyroid gland in indigenous and in non- indigenous population in the Republic of Sakha (Yakutia).

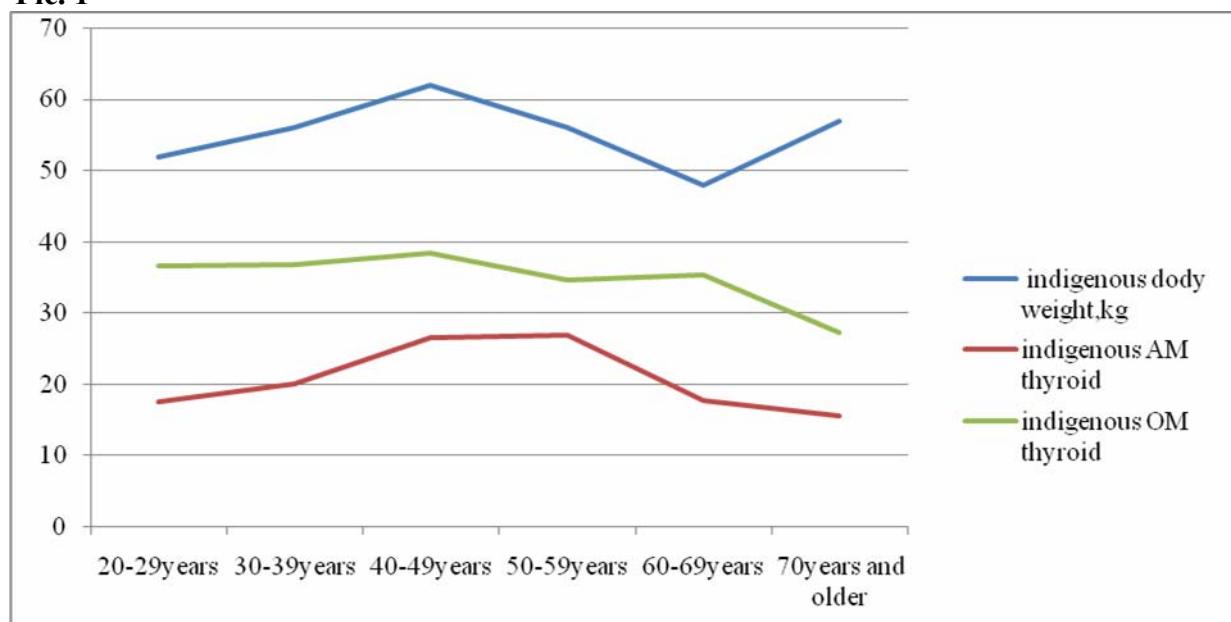
References:

1. Agadzhanjan N.A. Petrova. P.G. Chelovek v uslovijah Severa [Human in the North]. Moscow: KRUG, 1996, p 57.
2. Al'perovich B.I. Jendemiceskij zob v Jakutii [Endemic goiter in Yakutia]. Yakutsk, 1963, pp.95.
3. Gorbachev A.L. Strukturno-funktional'nye osobennosti tireoidnoj sistemy cheloveka i ego mikroelementnyj status v uslovijah severo-vostoka Rossii [Structural and Functional Features of the Human Thyroid System and Trace Element Status in the North- East Russia] avtoref.dis. ...d-ra.biol.nauk [Author's abstract of dissertation for Doctor of Biological Sciences]. Arkhangelsk, 2002, p. 42.
4. Danilova G.I. Jendemiceskij zob u detej Respubliki Saha (Jakutija) [Endemic goiter in children of the Sakha Republic (Yakutia)] avtoref. dis. ...kand. med.nauk [Author's abstract of dissertation for Candidate of Medical sciences]. Moscow: 1999, p.17
5. Kasatkina Je.P. Diffuznyj netoksicheskij zob [Diffuse Nontoxic Goiter] Voprosy klassifikacii i terminologii. Problemy jendokrinologii [Classification and Terminology. Problems of Endocrinology], 2001, V.47, № 4, p.3 -6.
6. Kobozeva N.V. Gurkin Ju.A. Perinatal'naja jendokrinologija [Perinatal Endocrinology] Leningrad: Medicine, 1986, p.310.
7. Tupikina E.B. Stepanov S.A. Bogomolova N.B. Amirova N.A. Morfofunktional'naja harakteristika kletochnyh tkanevyh komponentov shhitovidnoj zhelezy pri ee patologii [Morpho-functional Characterization of Cellular Tissue Components of the Thyroid Gland in its Pathology]. Arch.patology, 2000, V. 62, № 5, p.24 -29.
8. Argunov V.A. Makarov A.D. Trufanov A.S. O rake shhitovidnoj zhelezy v Jakutii [Thyroid Cancer in Yakutia] Voprosy profilaktiki rannej diagnostiki i lechenie zlokachestvennyh novoobrazovanij: Materialy XII mezhregional'noj konf [Prevention Isues of Early Diagnosis and Treatment of Cancer. Proceedings of XII Federal Conference] Yakutsk: Edition of Sphere, 2007, p. 111-113.
9. Dedov I.I. Sviridenko N.Ju. Gerasimov G.A. Ocenka jodnoj nedostatochnosti v otdel'nyh regionah Rossii [Assessment of Iodine Deficiency in Some Regions of Russia. Problems of Endocrinol], 2000, V.46, № 6, p. 3-7.
10. Ivanov P.M. Petrova P.G. Kuznecov A.V. Harakteristika zbolevaemosti i sostojanie specializirovannoj pomoshhi bol'nym rakom shhitovidnoj zhelezy v Jakutii [Characteristics of Illness and Condition of Specific Specialized Care for Patients with Thyroid Cancer in Yakutia] Materialy mezhregion. nauchn.-prakt. konf. s mezhdunar. uchastiem [Proceedings of the Federal Scientific Research Conference with International participation]. Yakutsk: Edition of Sphere, 2009, p. 51-54.
11. Hmel'nickij O.K. Morfofunktional'naja harakteristika shhitovidnoj zhelezy plodov i novorozhdennyh po sekcionnym materialam Sankt-Peterburg [Morpho-functional Characterization of the Thyroid Gland of Fetuses and Neonates by Sectional materials. St. Petersburg]. Arch. Pathology, 2001, V.63, № 5, p.13 -18.

Table
Average dimensions of height, width, thickness of both lobes of the thyroid (cm) depending on the age

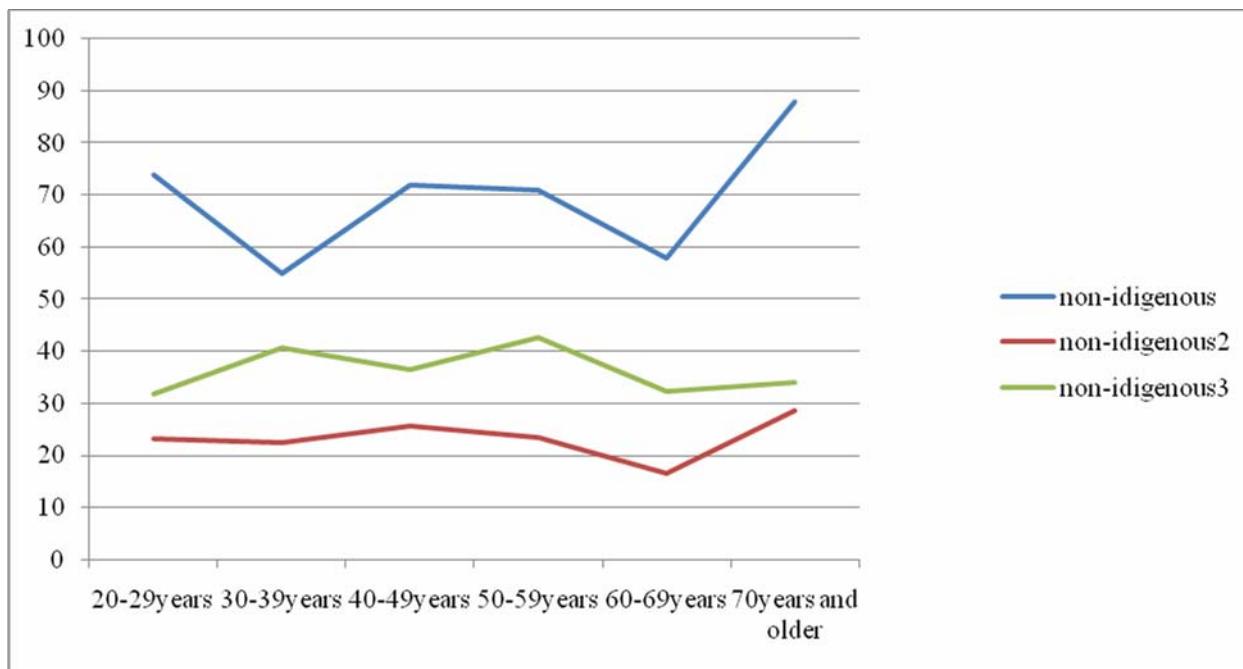
Parameters of the thyroid gland	Ethnos	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70 years and older
Height of the left lobe	indigenous	4,2	5,0	4,7	4,2	4,7	4,5
	newcomers	5,7	4,2	5,8	5,0	4,6	5,2
Height of the right lobe	indigenous	4,6	5,2	5,0	4,2	4,7	4,7
	newcomers	5,6	4,7	5,4	5,2	4,3	5,8
Width of the left lobe	indigenous	2,8	2,7	2,8	2,7	3,1	2,5
	newcomers	3,0	2,4	2,9	3,0	3,0	3,2
Width of the right lobe	indigenous	2,8	3,0	3,1	3,0	3,1	2,7
	newcomers	3,4	3,1	3,2	3,6	3,3	3,7
The thickness of the thyroid gland	indigenous	1,5	1,7	1,4	0,9	1,1	1,0
	newcomers	1,1	1,5	1,6	1,9	1,0	1,4

Pic. 1



Mean body weight (kg), the average thyroid AM and OM of indigenous Sakha (Yakutia).

Pic. 2



Mean body weight (kg), the average thyroid AM and OM of non-indigenous population of Sakha (Yakutia).

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