

Ethnicity as a Possible Unaccounted-For Risk Factor for Keratoconus

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Keratoconus is a chronic, dystrophic, hereditary and bilateral (in 96% of cases) disease with a characteristic progressive thinning, deformation and cone-shaped protrusion of the cornea. Pathological changes that occur in adolescence and young age lead to the development of improper astigmatism, clouding of the cornea, a pronounced decrease in visual acuity, and in the future - to disability in working age. Therefore, the problem of keratoconus is of great medical and social importance for world ophthalmology as a whole, and for Russia, in particular. The causes of keratoconus are hereditary, endocrine, metabolic, immunological, allergic and other disorders, which indicates not only the multifactorial nature of the disease, but also the lack of sufficient scientific knowledge about its nature.

The most recognized is the hereditary-metabolic theory of keratoconus etiology and pathogenesis. For the southern regions of Russia, the problem of keratoconus is of great medical and social importance, due to a steady trend towards an increase in the frequency and expansion of the age range of patients.

In the ophthalmological literature, there is little information about the prevalence of keratoconus in different ethnic groups, peoples and nationalities of the world's population, but there is an increased frequency in the southern and highland regions, as well as among the "ancient" peoples (Armenians, Greeks, Jews), peoples of the race and Muslims.

We comprehensively examined 74 patients (136 eyes) with keratoconus of all stages living in the south of Russia, in the Krasnodar and Stavropol territories, the Republics of Adygea, Dagestan, Karachay-Cherkessia, Kabardino-Balkaria, North Ossetia-Alania, Crimea, Ingushetia and the Republic of Abkhazia. The age range of the patients was 15 - 50 years and the median age was 28.43 ± 0.89 ($n = 7.45$) years. The majority were urban dwellers - 47 (63.5%) patients, in rural areas lived 27 people (36.5%).

The population of the Krasnodar and Stavropol territories, as the largest entities of the considered region of the south of Russia, according to estimates for 2021, is more than 5 million 683 thousand and more than 2 million 792 thousand people, respectively. The overwhelming majority inhabiting the two territories are Russians, who make up 86.5% in the Krasnodar territory, and 80.1% in the Stavropol territory. Armenians occupy the second place in terms of number in both regions: in the Krasnodar territory - 5.4% and in the Stavropol territory - 5.8%. National minorities, to which Ukrainians belong in the Krasnodar territory, make up 1.6%, in the third position are Tatars - 0.5%, then Greeks - 0.4% and Georgians - 0.4%. In the Stavropol territory, the third position is occupied by the Dargins - 1.8%, then the Greeks - 1.2%, the Roma - 1.1% and the Ukrainians - 1.1%. Less than 1% of the population in the Stavropol territory are Nogais

- 0.8%, Azerbaijanis - 0.6%, Karachays - 0.6% and Chechens - 0.4%. In general, national minorities in both regions occupy between 1 and 2 per cent of the population.

When studying the ethnicity of the examined patients with keratoconus, we revealed the predominance of representatives of the North Caucasus and Transcaucasia. Representatives of the North Caucasus, Armenians and Jews accounted for a total of 75% (54 patients). Russians and other Slavs were significantly less - 18 people (25%). Armenians were the most - 19.1% of the total number of patients with keratoconus examined. Quite often, Cherkessians (12.5%), Ossetians (11.8%) and Dagestanis (10.3%) were with keratoconus. Keratoconus was much less common in Chechens (4.4%) and Adyghe (4.4% each), Jews, Azerbaijanis and Ingush (2.9% each), Abkhazians (2.2%) and Greeks (1.5%). In total, representatives of the North Caucasus alone accounted for 48.5% of the total number of our patients with keratoconus.

Thus, Armenians, as representatives of one of the “ancient” peoples, were more susceptible to the development of keratoconus. The small number of representatives of other “ancient” peoples (Jews and Greeks) is explained by their small proportion in the population of the population of southern Russia. The marriage structure in the populations of “ancient” peoples indicates a still preserved genetic “isolation” and a high level of closely related relationships, since interethnic marriages are quite rare, which can lead to the accumulation of genetic “breakdowns” and an increase in the frequency of hereditary pathology. We tend to believe that this explains our results.

In addition, the impact of the factor of excessive insolation cannot be completely ruled out, since the southern regions of Russia fall into the zone of the highest level of sunshine in our country, which is more than 2200 hours a year.

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