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Short Communication

Why not all people get COVID-19?

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Abstract

Apparently, with COVID-19, all individuals in the population can become infected. However, not all infected individuals seek medical help. Perhaps most people carry the infection relatively easily, and some may not notice at all that they have contracted COVID-19. Factors aggravating the course of COVID-19 are known: age, obesity, low blood oxygen saturation (below 88%), diabetes, chronic heart disease, weak immunity, and vitamin D and K deficiency. Nevertheless, quite a few mysteries remain, and one of them is the low mortality in Africa. For example, in 2020, Africa, with its 1.2-billion population, recorded fewer deaths than the United States recorded in just one day. This is explained by the timely introduction of quarantine measures and age (only 2% of Africa's population is over 65, compared to 23% in Italy). We, however, believe that the vulnerability of some people to COVID-19 is related to a little-studied constitutional feature of humans, namely, the heat conductivity of their bodies. It turns out that the course of the disease is most severe in individuals with low body heat conductivity.

Keywords: COVID-19; human body heat conductivity; chromosomal q-heterochromatic regions; cell thermoregulation; human vulnerability to COVID-19

Introduction

Apparently, with COVID-19, all individuals in the population can become infected. However, not all infected individuals go to the hospital or seek medical help. Perhaps most people carry the infection relatively easily, and some may not notice at all that they have contracted COVID-19. Factors aggravating the course of COVID-19 are known: the most important was the age and obesity. There are other factors that can affect the course of the disease: low blood oxygen saturation (below 88%), diabetes, chronic heart disease, weak immunity and vitamin D and K deficiency.

Nevertheless, there are still quite a few mysteries, and one of them is the low mortality from COVID-19 in Africa. The number of deaths from the coronavirus in Africa has been and remains surprisingly low. For example, in 2020, at the height of the pandemic, 1,556 people died from the coronavirus across the entire African continent. At that time, Africa, with its 1.2 billion population, recorded fewer deaths than the U.S. recorded in just one Friday. For instance, in South Africa, over five thousand people tested positive for the coronavirus, and only 103 people died from COVID-19. Per capita, 70 times fewer people died from the coronavirus in Africa than in Denmark. This situation is explained by the timely introduction of quarantine measures and the age of the population (only 2% of Africa's population is over 65 years old, compared to 23% in Italy).

We believe that not only Africans, but people in general, have resistance to COVID-19 linked to a little-studied constitutional feature of humans. By this factor, we mean a little-studied physical trait of a man, namely the level of heat conductivity of their body. In particular, it turned out that people with low body heat conductivity (BHC) have a harder time dealing with COVID-19. Our studies showed that people who were admitted to the hospital with COVID-19 had low BHC [1,2].

How could one explain the relative resilience of individuals with high BHC to COVID-19? To do this, it is first necessary to clarify the concept of human BHC and where it came from. BHC is the physical (phenotypic) manifestation of the phenomenon of cellular thermoregulation. The essence of the cell thermoregulation (CT) is the elimination of the temperature difference between the nucleus and cytoplasm with the help of a dense layer of condensed chromatin. The condensed chromatin (CC), the densest structure in an interphase cell, localized between the nucleus and cytoplasm, is made of chromosomal heterochromatin regions (HRs). The density of CC packing, accordingly, its heat conductivity, depends on the quantity of chromosomal HRs in its structure, which can affect its heat-conducting ability [3-5].

It has been experimentally shown that the effect of CT can be indirectly assessed on the level of the whole organism as BHC. In particular, the number of chromosomal Q-HRs influence on the level of the human BHC. In other words, there are some parallels in the distribution of the number of chromosomal Q-HRs and variability of human BHC [7]. The material basis of the CT is a dense layer of CC around the nucleus, consisting of chromosomal HRs. It has been found that individuals in the population differ from each other in the number of chromosomal HRs, which affect the thermal conductivity of CC, and (ultimately) at the final level influence the level of human BHC [3,7].

Earlier we have showed that: a) individuals in a population differ from each other on the level of BHC; b) individuals differ in BHC from different age groups, on the average human BHC level is steadily changed decreasing with age; c) individuals with obesity are characterized by extremely low BHC; d) natives of low geographical latitudes differ on average in higher BHC than the inhabitants of the highlands and high latitudes [2-5]. It is noteworthy that these results correspond to the data obtained in the study of the quantitative content of chromosomal Q-HRs, which determines the level of human BHC [3,6-18].

As statistics show, most often indications for hospitalization were in patients over 75 years old, as well as people over the age of 65 and those who were obese. In the light of the above, related to the wide variability of the BHC level in individuals in the population, this circumstance could find a rational explanation. The thing is that the excess heat must leave the body; otherwise, it causes a rise in temperature that is incompatible with life. As heat cannot be used by the body as a source of energy necessary for useful biological work, removal of heat is the most important task of thermoregulation, since only a few degrees are needed to prevent thermal death. If heat dissipation into the external environment ceases completely, dangerous events of overheating during complete muscular rest may develop in 3-4 hours in man; in mice the corresponding period takes about 40 minutes, while in small birds only a quarter of an hour. During moderate muscular exercise these periods are several times shorter [19].

The pathogenesis of resistance in individuals with high BHC to COVID-19 can be schematically represented as follows. When viruses enter a cell, they start using the host's nucleus to produce additional ribosomes on top of the ones already present. This process will inevitably be accompanied by the release of extra heat in the nucleus, which needs to be removed in a timely manner. The transfer of thermal energy from the nucleus to the cytoplasm occurs through the CC layer, the density (and thus the heat conductivity) of which depends on the number of chromosomal Q-HRs in the cell. If an individual's genome has few chromosomal Q-HRs, it is expected that the nuclei of their cells will struggle with dissipating excess metabolic heat. If the removal of excess heat from outside the nucleus is difficult or impossible due to insufficient CC density, this can lead to thermal death of cells with all the resulting negative consequences for the entire body. Perhaps for this reason: a) individuals with low BHC have a harder time coping with COVID-19; b) the number of people with COVID-19 is highest among residents of moderate and high latitudes. It has been found that indigenous people of the African continent have the highest number of chromosomal Q-HRs in their genome among human populations in Eurasia and Africa [12,14]. Therefore, we believe that the resistance of both Africans and others to COVID-19 can be explained to a feature of their genome, namely the high content number of chromosomal Q-HRs, which are responsible for the variability of human BHC levels in the population.

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I apologize to those authors, whose works were not cited, or were cited only through reviews, owing to space limitations.

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