

# Covid-2019, Age and Human Body Conductivity

**Abyt Ibraimov\***

Laboratory of Human Genetics, Kyrgyzstan



## Opinion

Covid 2019 epidemic data in the world is changing daily. For example, by the beginning of March, the outbreak in 2019-2020 has caused at least 107,351 confirmed infections and 3,646 deaths. In those under the age of 50 the risk of death is less than 0.5% while in those over the age of 70 it is more than 8%. No deaths had occurred under the age of 10 as of 26 February 2020. This trend is still prevailing around the world. This circumstance prompted us to pay attention to the possible role of another factor that could affect to the vulnerability, and the severity of the clinical course of Covid-2019. By this factor, we mean some features of the body of the elderly. It seems highly probable to us that one of the reasons why individuals over the age of 70 have a more severe clinical course and high risk of death from Covid-19 is the physical characteristics of their bodies, namely the level of their thermal conductivity. Since this constitutional feature of the human body has a hereditary nature and is still little known to clinicians, it was considered necessary to give very short information. We are talking about the features of thermoregulation of the human body, depending on his age.

Thermoregulation at organism level is the well-established fact. However, the question on possibility of thermoregulation at the cell level remains opened. Based on study of distribution of chromosomal heterochromatin regions (HRs) in various human populations, in norm and at some forms of pathology the existence of thermoregulation at the cell level has been established. The essence of cell thermoregulation is elimination of the temperature difference between the nucleus and cytoplasm when the nucleus temperature becomes higher than the cytoplasm temperature [1-4]. As it's known thermal conductivity is the process of heat energy propagation by direct contact of bodies having different temperatures. In all materials, heat is transferred through the transfer of energy by micro particles. Fast moving micro particles give their energy to more slowly ones, thus transferring heat from the zone with high to the zone with low temperature leads to equalization of body temperature. Virtually, there is nothing new in the idea that the body of the human should possess some heat conductivity [3,4].

Through trial and error, we have identified areas of the body and the thermal load mode, which allows to roughly estimate the level of human body heat conductivity (BHC): high, medium and low. Results obtained show that individuals in population truly differ from each other in BHC and its level depends on the number of chromosomal HRs in genome [3,5]. Our results show that on the population level:

- 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. Weight, height, types of body constitution, pulse rate and level of arterial pressure do not effect on the variability of BHC in population [3-5].

The principle of the method and assessing the level of BHC is very simple. To evaluate human BHC it is necessary to:

- A. Create a temperature gradient between a certain part of the human body and the environment. To this end, the left hand is immersed in a water bath, where the water temperature is set at 9 °C higher than the temperature of the left palm of the individual under study.

\*Corresponding author: Abyt Ibraimov,  
Laboratory of Human Genetics, Kyrgyzstan

Submission:  March 10, 2020

Published:  March 17, 2020

Volume 1 - Issue 1

**How to cite this article:** Abyt Ibraimov. Covid-2019, Age and Human Body Conductivity. COJ Biomedical Science & Research. 1(1). COJBSR.000503.2020.

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B. For 20 minutes, the temperature of the right palm is measured every minute (the transition of thermal energy from one part of the body to another) using a non-contact thermometer which are used today in connection with the epidemic of coronavirus.

C. The time of onset of the temperature maximum on the right palm (rate of transition of thermal energy) shall be recorded [5].

To study the possible role of age in the pathogenesis of Covid-19, it is proposed to use a simple rapid method for assessing the level of human BHC. This does not require a special device and can be checked by measuring the temperature of the palm and mouth at rest. If the temperature difference between the palm and the oral cavity does not exceed 1.0 °C, then such an individual has a highly heat conductive body. If this difference exceeds 2.1 °C then such an individual has a low-heat conductive body [4,5]. Why do we think it is important to investigate the possible role of the human BHC level in the fight against the Covid-19 epidemic? Firstly:

A. The level of BHC is the same constitutional attribute as the color and texture of the skin, form of body or height

B. A human's ability to adapt to different climatic and geographical conditions also depends on his BHC

C. In the pathogenesis of such purely human forms of pathology as alimentary obesity, alcoholism, drug addiction and atherosclerosis, the level of BHC is of great importance (for more details see [6-11]).

Secondly, according to the principle of temperature homeostasis, excess heat must leave the body; otherwise, dispersing in tissues, 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 apparently the most important task of thermoregulation, since only a few degrees are needed to prevent thermal death. If heat emission 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 [12]. Thus, the organism is not a thermal "machine" and does not use heat to perform physiological work. Therefore, thermoregulation is mainly directed at preventing overheating of the organism, which in terms of biology is more dangerous [13].

Above said we want to emphasize that the level of BHC is most directly related to the ability of the human body to promptly and effectively remove excess heat outside his body. Since the level

of BHC in the population of elderly individuals is the lowest, it is easy to imagine how difficult it is to deal with an increase in body temperature and its effective elimination. It is no coincidence that the main symptoms of Covid-19 are fever, cough, and shortness of breath. If it turns out that elderly individuals who have died and recovered from Covid-19 will statistically significantly differ in BHC level, then this fact could be used to correct treatment tactics for this and similar infections. In short, older people with low BHC will experience serious difficulties in removing excess heat outside the body. When asked why the author himself did not test his hypothesis, I can only note that cases with Covid-19 have not yet been registered in Kyrgyzstan [14].

### Acknowledgement

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

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