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ABOUT SOME FEATURES OF DISEASE DEVELOPMENT

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დაავადების განვითარების ზოგიერთი თავისებურების შესახებ

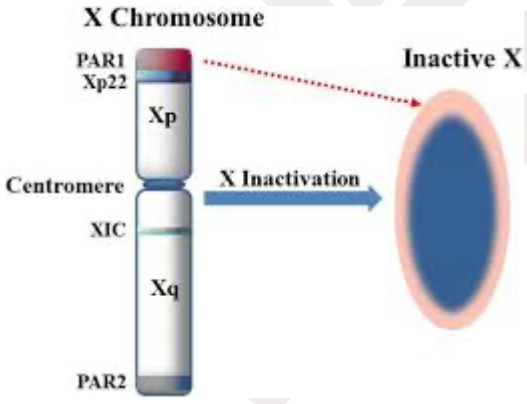
თსსუ მოლეკულური ბიოლოგიის და პარაზიტოლოგიის დეპარტამენტი

ნაშრომი ეძღვნება გამოჩენილი ქართველი ვირუსოლოგის, პროფესორ ბორის კორსანტიას ნათელ ხსოვნას, რომელიც სწორედ COVID-19 -ით გარდაიცვალა და თავისი სიკვდილით ძალიან დაწყვიტა გული ყველა იმ ადამიანს, რომლებმაც კარგად იციან, თუ რას ნიშნავს ცხოვრებაში ნამდვილი მეცნიერის დაკარგვის ფასი!

რეზიუმე

ჩვენს მიერ ჩატარებულმა კვლევამ აჩვენა რომ 60 წელს გადაცილებულ ადამიანებში COVID-19-ით გამოწვეული სიკვდილიანობა უფრო მაღალი იყო და უფრო მწვავედ მიმდინარეობდა მამაკაცებში, ვიდრე ქალებში. თუმცა, ასაკის მატებასთან ერთად, ეს განსხვავება ნაკლებად საგრძნობი გახდა. ქალის ორგანიზმის მიერ ჭარბი რაოდენობის რკინის დაკარგვის უნიკალური უნარი, განვითარების ადრეულ პერიოდში ერთ-ერთი X ქრომოსომის გენების უმეტესი ნაწილის ინაქტივაცია, ასევე ქალის ორგანიზმში მიმდინარე სხვა სახის ფიზიოლოგიური, გენეტიკური და ეპიგენეტიკური ცვლილებები გარკვეულ უპირატესობას ანიჭებს ქალებს COVID-19 წინააღმდეგ ბრძოლაში, თუმცა აქვე უნდა აღინიშნოს, რომ COVID-19-ზე ჩატარებულმა კვლევებმა კიდევ ერთხელ დაადასტურა, რომ მამაკაცისა და ქალის იმუნიტეტი მნიშვნელოვნად განსხვავდება ერთმანეთისაგან და ეს გვაძლევს საფუძველს ვიფიქროთ, რომ მომავალში ამ მიმართულებით კვლევები კიდევ უფრო გაღრმავრდება.

It is known that on the 16th day of embryonic development in humans, one of the X chromosomes in all cells of the female embryo forms a sex chromatin body and one of the X chromosomes is inactivated, which means that the genes of the organism of the homogametic sex In the diploid set, only one dose of the largest part of the X genes takes place.



Moreover, if one of the X chromosomes is damaged, then it is first subjected to inactivation, which means that the defective X chromosome is excluded from the beginning in female organisms. It should be noted here that it is very important to inactivate the X chromosome in B-lymphocytes too, which synthesize antibodies specific to certain antigens. The specificity of such immunoglobulins requires a choice to be made by each cell in favor of expressing the maternal or paternal allele. Mosaicism in this case also gives an advantage to women in the fight against different antigens.

Another interesting feature of the female body is the ability to remove excess iron during reproductive age. When the body contains a large amount of iron, excess iron at this time is also particularly noteworthy, because women of reproductive age lose 500 mg of iron each year during the menstrual cycle. It should be said that iron in moderation is indeed a necessary element for the body, but its excess is very dangerous for health, because the content of a large amount of iron in the body can significantly damage it. Excess iron acts as a catalyst, converting relatively harmless hydrogen peroxide into hydroxyl free radicals (OH-), which destroy mitochondrial DNA, proteins, and membranes. At the same time, they increase inflammatory processes in the body and provoke various chronic diseases. In addition, an excess of iron leads to an increase in the number of pathological bacteria, fungi and protozoa

in the body. Moreover, in 1980, researchers hypothesized that gender differences in blood iron levels are one of the main reasons for the prevalence of cardiovascular disease in men. In addition, it is believed that excessive iron content affects the development of both type 1 and type 2 diabetes. The fact that women lose iron every month during menstruation is one of the reasons why women live longer on average than men. However, after menopause, women also face problems in this direction. Therefore, donation is a very good way to rid the body of excess iron. At the same times the epidemiological findings reported across different parts of the world indicated higher morbidity and mortality in males than females. They spoke about the several possible factors such as higher expression of angiotensin-converting enzyme-2 (ACE 2; receptors for coronavirus) in male than female, sex-based immunological differences driven by sex hormone and X chromosome. Furthermore, a large part of this difference in number of deaths is caused by gender behavior (lifestyle), i.e., higher levels of smoking and drinking among men compared to women. In this type of works, attention is also focused on that woman had more responsible attitude toward the Covid-19 pandemic than men. Irresponsible attitude among men reversibly affects their undertaking of preventive measures such as frequent handwashing, wearing of face mask, and stay at home orders. It is means that being male is also a factor.

As for us, our objective was to compare severity and mortality among men and women with COVID-19 who were known to us and was 60 years old or greater. Our study found that more men died of COVID-19 than women. Nevertheless, except for the majority of men, the disease progressed much more severely and with serious complications, which cannot be said for women. Here is the question whether it is true that men with COVID-19 are more likely to need intensive care and they are more likely to death? As we mentioned, statistical data show that the female body is better able to cope with this disease than the male. However, there are other data showing that in some countries more women than men died from COVID-19 in 2021.

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SUMMARY

The aim of our study was to determine the role of gender as a factor in the development of disease during infection with COVID-19 and whether the age of the patient along with gender was an important factor in causing lethal outcomes and the infection was much more severe in men, than in women. At the same time irresponsible attitude among men reversibly affect their undertaking of preventive measures such as frequent handwashing, wearing of face mask, and stay at home orders. It is means that being male is also a factor. Our study showed that in people over 60 years of age, mortality was higher in men. However, with age, this difference became less noticeable due to certain circumstances.

Finally, we would like to point out that, in our opinion, this new disease of the 21st century, COVID-19, has once again proven that the male and female immunity are significantly different from each other, and this gives us reason to believe that research in this direction will further develop in the future.

Keywords: Covid-19, Gender, Age