EPIDEMIOLOGY OF THE ENTRY OF COVID-19 INTO THE SAMARKAND REGION

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Annotation. *The mass spread of any infectious disease among the population is characterized by the conditions that determine its occurrence and development, as well as the intensity, composition, and dynamics of its spread. By observing and recording these manifestations, initial hypotheses are formed about the causes of the occurrence and spread of the disease. Comparison and analysis of various indicators characterizing the manifestations of the spread allow us to draw conclusions about the verification - confirmation or rejection of the formed hypotheses. After a certain idea is formed about the determinants of the spread of COVID-19, that is, the reasons for the emergence and spread of this disease from abroad in a particular region, a decision is made to organize and implement specific diagnostics of the disease, treatment and preventive measures, based on the existing infrastructure and capabilities of the healthcare system.*

Key words; *COVID-19, epidemiology, prevention, quarantine-restriction.*

ЭПИДЕМИОЛОГИЯ ЗАНОСА COVID-19 В САМАРКАНДСКУЮ ОБЛАСТЬ

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Аннотация. *Массовое распространение любой инфекционной болезни среди населения характеризуется условиями, определяющими ее возникновение*

и развитие, а также интенсивностью, составом и динамикой ее распространения. Наблюдая и фиксируя эти проявления, формируются первоначальные гипотезы о причинах возникновения и распространения заболевания. Сравнение и анализ различных показателей, описывающих закономерности распределения, позволяет сделать выводы о проверке — подтверждении или опровержении сформулированных гипотез. После формирования четкой картины о детерминантах распространения COVID-19, то есть причинах завоза этого заболевания из-за рубежа, его возникновения и распространения на конкретной территории, будет принято решение об организации и проведении конкретных диагностических, лечебно-профилактических мероприятий по данному заболеванию, исходя из имеющейся инфраструктуры и возможностей системы здравоохранения.

Ключевые слова; *COVID-19, эпидемиология, профилактика, карантин-ограничение.*

Relevance of the problem. According to the results of the study of the epidemiological significance of the introduction of Covid-19 into the Samarkand region [1,3], the first cases of infection with this disease in the region began to be observed in the first ten days of April 2020 among citizens of the city of Samarkand and Tayloq district returning from foreign countries as an “exotic” disease - an imported disease, and the disease continued to be registered among the population until December of this year [2,5,6]. During the epidemic period, that is, from April to December 2020, a total of more than 2,500 people were diagnosed with COVID-19 in the region [4,7.8].

Research material and methods. Analysis of the dynamics of COVID-19 cases shows that in April (45 cases) 1.8% of the total number of cases was recorded, while in May (280 cases) there was a sharp increase in the number of cases - 6.2 times compared to April. In June (178 cases), a slight decrease in the number of cases was recorded - 1.57 times compared to May. However, in July, a sharp increase in the

number of cases was observed again, that is, a 3.39-fold increase compared to June and amounted to 604 cases, which is 13.42 times higher than in April. High rates of the disease remained stable in August (670 cases) and September (550 cases). Of the total number of cases (2327 cases) recorded during the epidemic period, the absolute majority (1824 cases) were recorded in July-September.

To comprehensively assess the impact of quarantine and restriction measures on the intensity of the disease, COVID-19 cases were analyzed for 5 days of each month. As soon as the first case of COVID-19 was registered in Uzbekistan (March 15, 2020), mass events, air travel with foreign countries (March 16, 2020), and rail travel (March 19, 2020) were suspended, and the scope of restrictions was quickly expanded and the first strict quarantine was established (March 30, 2020 - May 8, 2020). As a result of these measures, the first wave of infection in Samarkand region was eliminated by the end of May - almost two months later. In the first two 5 days of June, no cases of COVID-19 were recorded in the region. The interruption of the chain of the COVID-19 epidemic process in the first 10 days of June can be directly assessed as a positive effect of strict quarantine measures. However, starting from the third five days of June, that is, a month after the easing of quarantine measures, COVID-19 infections began to be observed again in the region as a second wave of infections, the highest level of infections was recorded in the second ten days of July, and in general, this situation was similar to the epidemic situation observed in most regions of the republic. Therefore, a second strict quarantine was introduced in the republic from July 10 to August 11. Despite this, the second wave of COVID-19 infections in the Samarkand region lasted from the third five days of June to the fourth five days of October - exactly four months. The conducted analyses show that quarantine and restrictive measures are effective in controlling the COVID-19 epidemic process, but have a relative impact, that is, with the easing or cessation of this set of measures, the incidence of the disease will begin to increase again. This manifestation of the spread of the disease (in general, or rather, the epidemic process) is a natural phenomenon for exotic diseases transmitted by airborne droplets,

including COVID-19. The fact that the second wave of COVID-19 infection is more intense and lasts more than twice as long as the first wave is explained by the fact that over time, after the introduction of the disease from abroad, the number of sources of infection among the population increases and the nosocomial area expands. This situation may also be partly due to the decrease in the level of compliance of the population with the next quarantine and restriction requirements - the population's "fatigue" from quarantine and restriction measures.

Results and discussion. In order to clarify the level of reliability, the data obtained were analyzed. This analysis shows that the relative risk of COVID-19 infection among residents of “urban” areas is 1.9 times higher (RR=1.9) than among residents of “suburban” areas. The above data indicate that cities are a “risk zone” for the spread of COVID-19, and residents of cities and suburban areas, according to the level of morbidity, belong to the “risk group”. This difference in the intensity of the spread of the disease (epidemic process) is explained, first of all, by the different population densities in cities and areas, in particular, the higher population density in cities. In this case, of course, the population density is affected not only by people registered in the city, but also by regular visitors to cities from neighboring regions for work, education, commerce, medical services, household chores and many other activities - there are many factors that affect the "pendulum-like oscillation" of the city's population, and these factors should not be ignored. At the same time, in our opinion, it should be taken into account that for all "exotic", that is, infectious diseases that enter from outside, in most cases, they are initially brought to administrative centers and spread radially from this place to the surrounding areas. COVID-19, as an "exotic" infectious disease, was initially recorded precisely in the administrative center - the city of Samarkand and in the adjacent Tayloq district, and from these areas to the surrounding areas, radially, away from the center, was observed. The concentration of administrative, social, industrial, educational, commercial, healthcare, and many other facilities in the city, in addition to affecting population density, also contributed to the spread of the disease throughout the region

through those who applied to these facilities from the districts (or those who worked in them from the districts).

It is worth noting that all study participants were treated in inpatient settings, and that the treatment of patients in hospital settings is often determined by the manifestation and severity of clinical symptoms of the disease. That is, the presented morbidity indicators may reflect not only the intensity of the epidemic process, but also indirectly the severity of the disease.

In our opinion, the significantly lower incidence rate in children under 14 years of age compared to the average is consistent with the general trend in the age distribution of COVID-19 cases observed worldwide in 2020 and can be explained, first of all, by the initial state of the organism (before infection) and the pathogenetic mechanism of the disease. Differences in the incidence of age groups over 15 years of age were manifested, first of all, in proportion to the differences in the social activity of people in a particular age group. As a result of the analysis, it was found that members of the 15-49 age group belong to the risk group in terms of disease transmission. In the age group over 50, although the frequency of age-related factors leading to the manifestation and clinical exacerbation of the disease is higher, due to the introduced quarantine and restrictive measures, their social activity has decreased and the frequency of communication has decreased, the incidence rate in these groups has been reliably lower than the average among the population. This proves the effectiveness of the recommended quarantine and restrictive measures, such as maintaining social distance, wearing masks, and isolation.

It is important to analyze the incidence rate in different social groups of the population in order to determine the reasons for the differences in the intensity of the epidemic process among individuals of the same age group. Analysis by socio-professional groups shows that the lowest incidence rate of COVID-19 was recorded in the group of preschool children (11.5±3.4 per 100,000 people).

This indicator is 5.5 times lower than the average incidence rate of the general population (62.9), that is, significantly lower ($r<0.05$). At the same time, it is worth

noting that the incidence of children belonging to organized communities in this group (17.5±2.5) is 2.6 times higher ($r<0.05$) than the incidence of unorganized children (6.8±1.4). Compared to the average incidence of the population, the incidence of children in organized communities is 3.6 times lower, while the incidence of children in unorganized communities is 9.3 times lower.

It is one of the laws inherent in the epidemiology of diseases transmitted by the airborne mechanism that individuals of the same age group (including children) differ in their level of morbidity depending on their non-union and belonging to an organized community. All other things being equal, the incidence of infections transmitted by the airborne mechanism is necessarily higher among members of an organized community than among unorganized ones, and this is explained by the activation of the transmission mechanism in accordance with the grouping of people. In particular, the activation of the airborne transmission mechanism is determined by many factors, such as the duration of people's stay and communication inside the building, the number of people in the building, the level and volume of the room per person, the distance between people, the nature of ventilation.

Conclusions: Two waves of the intensity of the COVID-19 epidemic process were observed in Samarkand region in 2020. The second wave of the disease was more intense and longer than the first wave. The wave-like course of the intensity of the COVID-19 epidemic process is determined by the presence and extent of the conditions for transmission of the infection, that is, as a result of strict quarantine restrictions, the incidence decreased to a certain extent, and after the relaxation of these measures, it manifested itself in the form of a second wave. This manifestation of the epidemic process is natural for “exotic” diseases transmitted by the airborne mechanism, including COVID-19. The fact that the second wave of COVID-19 infection was more intense and lasted more than twice as long as the first wave is explained by the increase in the number of sources of infection among the population and the expansion of the nosocomial area over time after the introduction of the disease from abroad.

Analysis of the COVID-19 epidemic process showed that high rates of infection were recorded in July-September (“dangerous time”), in cities and peri-urban areas (“risk zones”), and among males, in the 15-49 age group, and among members of organized communities (“risk groups”). In particular, among members of organized communities, the incidence of infection among medical workers, civil servants, school and lyceum teachers, and college and university teachers is significantly higher than the average incidence of the population.

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