

PREVENTIVE MEASURES DIRECTED BY MODERN MEDICINE TO FIGHT LEPROA

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Abstract

In this article, the author reveals the nature of an ancient infectious disease - leprosy. Various aspects of the disease are also considered: the characteristics of the pathogen, mechanisms and routes of transmission. The article reflects the current epidemiological situation of leprosy in the world and in the Republic of Karakalpakstan. Basically, special attention is paid to preventive measures to combat this disease, and some methods of its treatment are also described.

Keywords: prokaza, leprosy, prevention, epidemiology.

ЗАМОНАВИЙ ТИББИЁТДА ЛЕПРАГА ҚАРШИ ҚАРАТИЛГАН ПРОФИЛАКТИК ЧОРАЛАРИ

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Аннотация

Ушбу мақолада муаллиф мохов касаллигининг табиатини очиб беради. Касалликнинг турли жихатлари очиб берилди; патогеннинг хусусиятлари, узатиш механизмлари ва йуллари. Мақолада жaxon ва Қорақолпоғистон Республикасида мохов касаллигининг эпидемиологик ҳолати акс этган.

Калит сўзлар: проказа, лепра, профилактика, эпидемиология.

ПРОФИЛАКТИЧЕСКИЕ МЕРЫ, НАПРАВЛЕННЫЕ СОВРЕМЕННОЙ МЕДИЦИНОЙ НА БОРЬБУ С ЛЕПРОЙ

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Аннотация

В данной статье автором раскрывается природа древнего инфекционного заболевания – лепры. Также рассматриваются разнообразные аспекты болезни: характеристика возбудителя, механизмы и пути передачи. В статье отражена современная эпидемиологическая ситуация по лепре в мире и в Республике Каракалпакстан. В основном, особое внимание уделяется профилактическим мерам по борьбе с данным заболеванием, также описываются некоторые методы его лечения.

Ключевые слова: проказа, лепра, профилактика, эпидемиология.

Over the past decade, the world has made significant strides in the fight against leprosy, also known as Hansen's disease. In 2019, just over 200,000 cases of leprosy were detected in 116 countries around the world. About 5% of cases had visible deformities at the time of diagnosis, which is 1.4 cases per million populations, which is 40% less than in 2014. Globally, the rate of new cases of the disease among children was 7.9 per million children, which is a significant improvement on the 2014 figure of 10.1. Virtually all new cases of the disease can now be cured within 6-12 months [2].

If we talk about leprosy, or Hansen's disease (as well as mournful disease, black sickness, the disease of St. Lazarus, Zaraat), then it is known from history that this chronic disease has been common throughout the world since ancient times. Leprosy, known to mankind since ancient times, is shrouded in a fog of legends and fears. Its homeland is considered to be the southeast of the Asian continent, from where it was brought to the north of Africa by Babylonian captives. In turn, Phoenician sailors contracted leprosy from the ancient Egyptians and spread it throughout Europe. In Greece, leprosy was called the "Phoenician disease" or leprosy. The term itself goes back to the Greek word "Lepis" - scales, as well as to the Indo-Germanic word "Lap" - peeling [1].

It is also known from ancient Egyptian papyri that leprosy was common in Egypt. For example, the doctors of Pharaoh Menepthekh, son of Ramses II, were, apparently, among the first who, studying this disease, expressed the idea of isolating lepers (for thousands of years there was a struggle between scientists about the causes of leprosy infection). [5]

This strange disease is also mentioned in the Old Testament: "When a person has a tumor, lichen, or a white spot on the skin that resembles a leprosy ulcer, he should be brought to the high priest Aaron or one of his sons ... The high priest will examine the wound. If the hair on it turns white, and it goes deep under the skin of the body, this is a leprous ulcer; the priest who performed the inspection must declare the person's body "unclean." Sometimes

the patient was closed for seven days to make sure that "the ulcer had not changed and had not spread over the skin." [8, p.87-105]

II. MAIN PART

The causative agent of leprosy is an immobile bacterium, close to tubercle bacillus (they belong to the same genus). In Latin, this bacterium is called *Mycobacterium leprae*. It was discovered by the Norwegian Gerhard Hansen and the German Albert Neisser back in the 70s of the XIX century. And by the beginning of the 21st century, it was studied well enough to try to solve the question of the origin of leprosy using comparative genomics. [4]

Views on the nature of the disease varied significantly depending on the region and a particular historical era. In some societies, it was believed that leprosy is the result of God's punishment, and the sick are sinful and punished. Accordingly, those around them should avoid them, without interfering with the realization of God's plan. In other cases, the sick was perceived as being possessed by the devil. And although later, the infectious nature of the disease received more and more recognition, nevertheless, most of the beliefs were of a purely negative nature, when the blame for the development of the disease was entirely laid on the patient himself. For example, among the Karakalpak people, leprosy was associated with the culture of food. If they eat fish, then on this day you cannot eat lactic acid products.

Another factor actively feeding folklore up to the 40s. XX century., was a view of leprosy as an incurable disease. It was believed that once, having struck a person, the disease would inevitably lead to death.

Unfortunately, there is no reliably proven specific prevention of leprosy with vaccines, sera, or immunostimulants. The main measures for the prevention of leprosy are early identification of patients and sources of infection, isolation of patients with active forms of leprosy, timely initiation of leprosy treatment with effective antibiotics, combination therapy; rehabilitation

of patients who have undergone treatment. Persons on dispensary records should be regularly examined by a leprologist or dermatologist.

Family members and persons who have been in close contact with a patient with leprosy are examined at least once a year. According to the indications, taking into account the lepromine test, they are given preventive treatment. Children of mothers with leprosy are usually born healthy, so they are separated from their mothers as newborns and transferred to artificial feeding. Patients who have completed treatment are contraindicated in rest in balneological sanatoriums, work in the food industry and children's institutions. According to some international agreements, the movement of patients from one country to another is prohibited. In places endemic for leprosy, mass surveys of the population, sanitary and educational work among the population and doctors are carried out. In addition to the epidemiological situation, socio-economic factors are of great importance, which explains the wide spread of the disease among the poorest people in Asia and Africa. In the health systems of these countries, the priority is to expand services for the detection and treatment of patients with leprosy and to ensure that modern treatment is available to all patients.

Prevention of leprosy among medical personnel and other persons who, by the nature of their activities, are in contact with patients, consists in strict adherence to sanitary and hygienic rules (frequent washing of hands with soap, mandatory sanitation of microtraumas, etc.). Cases of infection of medical personnel are rare.

Preventive measures are also carried out in accordance with the principle of epidemiological focus, which has always been at the forefront of all surveillance of especially dangerous natural focal infectious diseases. The modern concept provides for a priority, multiple examination and implementation of the entire preventive complex in small areas of maximum risk of diseases. In connection with the allocation of areas of outbreaks with

very high, high, medium, low and very low levels of epidemic danger for each of these gradations, a specific list and scope of investigative and preventive measures are being developed. In accordance with the performed differentiation of focal territories, for each of the outbreaks, its own individual Regulations are developed, containing a list of necessary preventive measures, terms, and territories for their implementation.

Thus, the results of epidemiological zoning are used not only to reasonably limit the search sites for areas with low population density, but also to increase the frequency and density of surveys of territories potentially dangerous for leprosy in combination with infections. All this as a whole makes it possible to maneuver the forces and means of epidemiological surveillance institutions, based on the specific epidemiological situation.

The key activities in the system of epidemiological surveillance in combined natural foci of leprosy and other dangerous infectious diseases of bacterial, viral etiology are monitoring and epidemiological surveillance of the population, carried out by the centers of hygiene and epidemiology of the Ministry of Health of the Republic of Karakalpakstan in the subordinate territories by type of monitoring.

Emergency specific and non-specific preventive measures for leprosy and other dangerous infectious diseases of bacterial, viral etiology are carried out when there is a real danger of human infection in the territories determined on the basis of the results of an epizootological survey [3].

The analysis of the primary information obtained during the monitoring of focal areas serves as the basis for further actions to carry out preventive measures, the main of which are the following:

- Identification of sources of infection and circumstances of infection of people;
- Sampling for laboratory examination of objects suspected as sources or factors of transmission of the infectious agent;

- Determination of the circle of persons at risk of infection from an identified source or transmission factor;
- Carrying out specific prophylaxis for persons at risk of infection (or living in the territory of an identified active natural focus of dangerous infectious diseases);
- Carrying out emergency disinfection in relation to probable sources and factors of transmission of infectious agents. [5]

It must be taken into account that if a sick person is not a source of the above infections, those objects that are defined as factors for the transmission of the pathogen to humans are subjected to disinfection.

Thus, at present, there is a need to improve epidemiological surveillance in endemic areas of natural foci of dangerous infectious diseases of a bacterial, viral nature, primarily in the Republic of Karakalpakstan, based on their differentiation according to the degree of epidemic danger using GIS technologies, which is an urgent task today, day.

Identified patients with lepromatous type and undifferentiated type of leprosy are subject to isolation in a leper colony with immediate intensive complex therapy. In the foci, current and final disinfection is carried out (3-6% hydrogen peroxide, 0.5% chloramine and other oxidizing agents), although the latter is often belated (if the necessary precautions and prevention have not been observed before). All contacts are subject to constant long-term clinical observation and verification using a lepromine test.

Individuals who are late-negative (with the exception of children under 1 year of age who are negative regardless of the epidemic situation due to, apparently, a particularly high sensitivity to the pathogen) should be considered infected and in the incubation stage. All these people are subject to extraordinary vaccination with BCG vaccine, since it has a positive effect in such cases (this can be seen from the lepromine test, which becomes positive). Of course, sanitary and educational work is of paramount importance

in the prevention of leprosy in endemic areas, which should include familiarization with the early signs of the disease and with the behavior of people in the foci when the disease is registered. In particular, the population should be prepared for communication at home - current disinfection of objects touched by the hands of the sick person, protection of the nasal passages and mouth from possible introduction of the pathogen by hands.

It is important to emphasize that in the past, the frequent occurrence of leprosy among members of the same family suggested the hereditary nature of the disease, and not at all its infectious nature. Therefore, children from families in which at least one person was sick with leprosy were forbidden to marry. And even after the infectious agent was discovered, members of the families in which the leprosy patient was kept continued to be ostracized. Later it became clear that even close and prolonged contact with the patient does not necessarily lead to the development of the disease. And still, in some countries, leprosy patients continued to be isolated from society. Often, this happened without the consent of the patient. For example, in Japan until 1996 there were laws supporting the forced isolation of leprosy patients [9]. Here it would be appropriate to say that the isolated maintenance and treatment of patients only strengthened in the minds of people the idea that leprosy is a more terrible infectious disease than all others. Unfortunately, many still hold the same opinion.

Another reason for this opinion about leprosy patients is the deformities and disabling conditions that were caused by the disease. Since in the lepromatous form of the disease, the skin thickens and becomes embossed, and the nose is wider, which makes it easy to identify the disease. The defeat of the limbs leads to a progressive loss of sensitivity, and in the future - to gangrene. And some patients may even have a distinct, sharply unpleasant odor coming from infected ulcers. In regions where the population is experiencing water shortages, this problem is often decisive in stigmatizing the

sick. Therefore, many patients, ashamed of their condition and ugliness, isolate themselves from society, all the more forming around the leprosy an aura of a shameful disease that must be carefully hidden. Patients often refuse to believe in the true diagnosis, delay treatment, and thereby exacerbate health problems.

III. RESULTS AND DISCUSSIONS

Thus, the above causes of stigmatization can be eliminated by the adoption of appropriate measures in society. For example, one important intervention may be the treatment of leprosy under the same conditions as most other diseases. We can be convinced of this by studies in India, which showed that social stigma is lower in those regions where patients with leprosy are treated together with other patients, and not separately [7]. This approach has other advantages, for example, reducing the time for diagnosing the disease and transporting the patient to a medical institution.

It is well known that a low level of education determines the prevalence of stigmatization in society. Education should be directed to patients, their peers and children. Educating patients will help them develop a positive attitude towards treatment, as well as prepare them for the rejection they may and may encounter in society. Advances in leprosy treatment technologies should be communicated to patients and their communities as early as possible. This is often crucial in overcoming stigma. For example, information related to drug therapy: Patients are no longer contagious after a few days of starting treatment.

Talking to children about leprosy can have a double effect, since not only children but also their parents will have the necessary information.

Also, one of the possible ways to destroy the barrier between the leprosy and society is to bring the disease out of the shadows using the mass media. For example, this practice has become widespread in India, where radio,

television, shop window advertising, buses and even clothing are used for these purposes.

Physical and socio-economic rehabilitation is an important component of the inclusion of recovered people in society. To this end, special programs are being created that allow people disfigured by the disease to acquire new professional skills, thereby opening the way to adaptation in society. Psychological support to patients will make the adaptation softer. In leprosy-endemic countries, group psychological counseling is of particular importance as the most convenient and financially less costly form.

IV. CONCLUSION

In conclusion, I would like to say that advances in microbiology and pharmacology have made it possible to control the spread of leprosy on Earth. Currently, large endemic foci of this disease persist in only a few countries. Combination therapy based on dapsons, clofazimine and rifampicin cures patients at all stages of the disease. It is also worth noting that the resistance of the causative agent of leprosy to the listed drugs has not yet been formed.

However, despite the obvious progress in the fight against the disease, many questions remain unresolved. For example, the lack of knowledge about the reservoirs, mechanisms, ways of transmission of infection does not allow us to clearly formulate the principles of disease prevention. The situation is also complicated by the long (often for many years) incubation period of the disease, which makes it difficult to timely identify the disease and isolate the carrier. Leprosy is considered a low-contagious infection and, nevertheless, tens of thousands of new cases of the disease are recorded annually in the world. What is the reason for this?! Is leprosy an anthroponotic disease spreading aerogenically, or does it have alternative reservoirs and transmission mechanisms?! How long can bacteria survive in the environment, and is it possible for them to reproduce there?! These are just some of the questions

that need to be answered to take one more step towards eradicating the disease. Until then, we can only talk about disease control [6].

But despite these shortcomings, 127,558 cases of leprosy were detected worldwide in 2020, according to official figures from 139 countries in six WHO regions. Among the sick were 8629 children under 15 years of age. The reported detection rate of new cases in the child population was 4.4 cases per million children.

In 7198 new cases, patients were diagnosed with disability group 2 (IG2), and the incidence of new cases of IG2 was 0.9 cases per million population.

At the end of 2020, 129,389 people were on treatment and the prevalence rate was 16.7 per million population. As a result of the COVID-19 pandemic alone, leprosy control programs have been disrupted, with new case detections down 37% in 2020 compared to 2019.

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