

Article

To Study the Main Factors Causing Cutaneous Leishmaniasis and the Impact of These Factors on the Incidence Rate

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Abstract: In order to increase the effectiveness of measures to prevent skin leishmaniasis in cities and districts, we analyzed the epidemiological examination cards of 120 patients registered in Surkhandarya region. Epidemiological examination cards were obtained according to the level of spread of the disease in relation to 3 regions: hyperendemic, mesoendemic and hypoendemic. Hyperendemic areas are 29 from the city of Termiz, 23 from Termiz district, 24 from Jarkurgan district, and 12 from Angor district. Mesoendemic areas are 11 from Kumkurgan district, 8 from Boysun district, and 6 from Sherabod district. Hypoendemic areas - 4 from Muzrabot district, 3 from Kyziriq district. Human social activity has led to changes in the composition of the disease among young people. If we take the figures from 1960-1966, sick children accounted for about 70.0%, and adults for 30.0%. In 1986, the analysis of the age-related structure of cutaneous leishmaniasis shows that in Uzbekistan, children under 14 years old make up 21.7%, and adults (15 years old) make up 78.3%. Data on the average number of leishmania in one patient were studied. E.M. According to Pershina, an average of 11.4 wounds per patient, A.Sh. According to Vaisov - 4.2, M.K. Sharipov and others note that 80% of patients have 1-3 wounds.

Keywords: cutaneous leishmaniasis, epidemiological investigation, deratization, preventive measures, sand mice

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1. Introduction

From the epidemiological examination cards of 120 analyzed patients, the following was revealed: the incidence by gender was higher among men than among women, the disease was mainly detected more often in the autumn months [1], [2].

The disease was 3 times more common in adults (78%), compared to children under 14 years of age (22%). The analysis of the professions of people infected with cutaneous leishmaniasis in Surkhandarya region shows that; the most infected were observed among workers (26%), among housewives (19%), among students (17%), and among those who did not work anywhere (13%), students (11%), pensioners (7%) and among the rest of the profession, the incidence was relatively less.

People with a high probability of getting sick are mainly workers of active age, students, housewives and students. When analyzing the medical history of 120 analyzed patients, the following was found [3-6]. The locations of the wounds on the body of the patients were different.

2. Materials and Methods

Sanitary culture and standard of living of the population are of great importance in the implementation of preventive measures against cutaneous leishmaniasis. To achieve this goal, it is necessary to perform the following tasks. Strengthen sanitary-propaganda activities among different strata of the population, especially among children. Involve the general public and community activists for the continuous implementation of preventive measures.

3. Results

Table 1. Analysis of prevalence of cutaneous leishmaniasis among people of different professions in Surkhandarya region

No.	Job	Absolute number	%
1.	Worker	479	26
2.	Housewife	351	19
3.	Student	203	11
4.	School student	314	17
5.	Teacher	74	4
6.	Builder	55	3
7.	Pensioner	129	7
8.	It doesn't work anywhere	240	13
	Total	1845	100

Sanitary culture and standard of living of the population are of great importance in the implementation of preventive measures against cutaneous leishmaniasis. To achieve this goal, it is necessary to perform the following tasks. Strengthen sanitary-propaganda activities among different strata of the population, especially among children. Involve the general public and community activists for the continuous implementation of preventive measures. Measures taken against cutaneous leishmaniasis:

- 1) Fight against sand mice - deratization, mechanical destruction of nests of large sand mice.
- 2) Fight against pests and carry out disinsection in settlements.
- 3) Individual protection against the attack of Iskabtopars.
- 4) Early identification and treatment of patients, epidemiological investigation.
- 5) Special prevention.
- 6) Improvement of sanitary condition of settlements.
- 7) Sanitary educational works.

Deratization works are carried out by a group of disinfectants under the guidance of a zoologist, entomologist, or assistant entomologist (in their absence, an assistant entomologist or epidemiologist). Before starting work, a tactical work plan is drawn up, the

amount of work to be done, the time of its completion, consumables, manpower, transport, special work clothes, etc. are calculated.

Before deratization, residents and heads of enterprises are warned and a special order is adopted in agreement with local leaders. (It is forbidden to feed animals and poultry in the area to be deratized). The area to be deratized is zoologically inspected. It takes into account the number of rodent sand mice, their living and non-living nests, wells, livestock especially poultry farms, areas where animals are fed, etc.

The main document of deratization works is the contour map of the area. A large scale map (1:10000 or 1:25000) is created. The plan of the land use or reclamation department under the agricultural department of the hokimia is used for its preparation.

On the card, the number of swarms of sand mice (living and non-living swarms) is indicated by different symbols, for example + and 0. During the inspection of the areas to be deratized and neutralized, a primary initial card is created. Natural hearths in the field and nearby areas are separated from each other by irrigation channels and collectors. Although it is true that large sand mice move from one area to another, in order to prevent it, it is necessary to completely exterminate them. Deratization works are carried out in areas with a radius of 3-5 km from settlements and field sheds.

4. Discussion

Deratization works should be carried out throughout the year using feed poisoned with zinc phosphide, and rodent extermination should be carried out on all non-rainy days of the year, but it is desirable to carry out mainly in early spring (before the blues appear) and late autumn. Deratization works can be carried out throughout the day in spring and autumn. On hot days, it is better to work in the morning and in the second half of the day when the hot temperature drops. From an ecological point of view, this is a convenient time to fight against rodents that are active during the day.

Deratization is carried out 3 times a year. Round 1 (January-March); this period is aimed at the extermination of pregnant gerbils, as well as the extermination of winter rodents infected with leishmaniasis. 2nd round (May); aimed at strengthening the results of the first round. 3rd round (September-December); aimed at reducing the number of rodents coming out of winter, which may have an epidemiological effect next year.

After deratization, it is necessary to check its effectiveness. For this purpose, each disinfectant is given a certain area and it checks the effectiveness of deratization 2 times a month, if there are still living nests, it is medicated.

Mechanical destruction of large sand mouse swarms. L.M. The expedition of the Isaev Institute of Medical Parasitology was one of the first to use new methods to combat large sand mice and mosquitoes on 40 hectares of desert land, i.e. using DT 75M, T 150 and PN 4 35 M type K 700 earth-moving tractors with an umbrella plow, it was achieved to destroy large sand mice by mechanical method. No toxic chemicals are used. The advantage of this method is that it is possible to eliminate the TL carrier, the infector and the trigger at the same time. But this method cannot be used near ditches and canals, near railways, and in cemeteries. Only poisonous food is used here.

The mechanical method is mainly used in the development of protected lands. One or more working groups or brigades are formed according to the volume of work to be performed. The working group includes a zoologist who is also the leader and one or two disinfectants, a tractor and its driver. Depending on the conditions and size of the work to be performed, several brigades are formed and managed by a DSENM entomologist or zoologist.

DSENM of the province or district prepares a work plan in advance, the amount of work carried out in it, the time of completion, the manpower in the required work crews, household appliances, products, oil and fuel products and other expenses are indicated and work is carried out on this basis.

4.1. *Dealing with bedbugs - home and field disinsection*

To fight with iskabtopars is to destroy them in fields and houses, in animal dens. Among the main effective toxic chemicals, these are DDT and hexochloran preparations, which affect iscabtopars during the entire development period. An aqueous suspension or emulsion is prepared from these preparations. Processing is carried out using automax and other spraying devices, as well as tractors, scooters and motorcycles. However, the use of some chlorinated hydrocarbons is limited, and safe and effective insecticides for human health are being sought.

There are 2 rounds of fighting against Iskabtopar. Round 1 starts in mid-April (before the first generation takes off) and ends in the first ten days of May. The 2nd round will be held during July (in order to prevent the second generation of mosquitoes).

All places where skeptoparas breed in every residential and non-residential house in the settlement are disinfected. Damage includes the internal and external walls of the building, sheds, porches, toilets and their enclosures, garbage pits, laundry enclosures, and rodent nests around them.

All rodent nests within a radius of 3 km from the settlement should be disinfected against scaptopar. Insecticides that do not affect human health and the quality of the equipment in the room should be used to infest living rooms.

It is recommended to use a 2% aqueous solution of chlorophos at 100 ml/m² or a 2% suspension solution of chlorine to disinfect the interior walls of the rooms. In order to disinfect the outer walls of houses, porches, verandas, toilets, rooms where animals are kept, the solutions are sprayed thickly.

In the disinfection of large sand mouse nests, 3-5 grams of hexochloran DUST or hexochloran insecticide fumigants are sprayed into the holes of each nest. In the absence of DUST or hexochloran, 10% DDT is sprinkled about 6-8 g per hole.

4.2. *Epidemiological examination of the disease*

Early detection and active treatment of the patient prevents it from playing a role as a source of the disease. Identification of patients is carried out by DPM staff. Before the beginning of the epidemiological season, seminars will be held with the involvement of DPM employees and district medical staff. Patients are identified by going from house to house, as well as going to kindergartens, schools, enterprises, field sheds and institutions, each person is surveyed and examined it is determined that there is a symptom of a disease on the skin. Routine identification of patients should be carried out twice a week from July to October, and once in November and December. When a suspected leishmaniasis patient is identified, a medical worker should provide first aid, i.e. apply a dry bandage to the wound and report to DSENM urgently.

A DSENM employee (parasitologist or his assistant) will arrive at this location to confirm the diagnosis and collect samples for parasitological examination and perform parasitological examinations on all suspected patients. Also, the patient and all persons who live or work with him will be questioned and examined.

Epidemiological examinations are completed in 2 copies on a special card. 1 will be left at the district DSENM, and the 2nd will be delivered to the parasitology department of the vil. DSENM.

Sanitation is an important, effective and radical measure aimed at preventing the complete loss of animal habitat and the proliferation of disease-carrying vectors in populated areas and natural habitats is an event. Sanitation works in inhabited punks are carried out in accordance with full sanitary standards (beautification and landscaping, regular cleaning of places from all kinds of garbage, waste, manure, demolition of rodent nests, demolition of neglected and abandoned shelters, beautification of cemeteries, etc.) will be implemented.

Improvement works should be carried out in areas with a radius of 3-5 km from the settlement, field sheds and other places. Sanitary improvement activities are carried out by economic organizations (state farms, collective farms, construction organizations, etc.). During the planning of the construction of settlements, DSENM employees conduct reconnaissance inspections in this area, determine whether there are harmful factors for the population, and determine its suitability for builders and users. If necessary, the DSENM officer may request that the construction work be moved to another safe area. If there is a need for construction in the areas where there are natural hot spots or nearby, the DSENM employee recommends in writing to the construction organization that it is necessary to plow and level the land in the area to be built and in the area with a radius of 3-5 km in the area of the future population center, offers.

5. Conclusion

Parasitic diseases are one of the most common diseases among people today. Leishmaniasis is a transmissible protozoan disease in humans and animals, the causative agent of which is *Leishmania*, Scabies is transmitted by mosquitoes. About 51 million people die every year in the world, 17 million of them die from infectious and parasitic diseases. Leishmaniasis is a tropical disease endemic in 98 countries around the world. From the epidemiological point of view, the most active natural foci of ZTL in Uzbekistan are found in Bukhara, Kashkadarya, Navoi, Surkhandarya regions and the Republic of Karakalpakstan. The natural source of the pathogen of ZTL in Uzbekistan is the large sand mouse and the red-tailed sand mouse, and its carrier is the mosquito. Over the past 10 years, the development of deserts and sand dunes has led to the delay of the period of damage, which leads to the late manifestation of ZTL patients.

If in 1973-1983 the boom period was recorded in September, now it is recorded in October. Such changes are associated with a decrease in the importance of the epidemic in the areas where the first generations (May-June) are being cultivated. The source of infection, the patient, gender and age do not affect morbidity. The main natural source of ZTL in Uzbekistan is the large sand mouse, the carrier of which is *Ph. papatasi* mosquitoes. Continuous improvement of ZTL treatment methods helps to remove patients from the ranks of disease sources.

The expediency of special prevention against ZTL is discussed. In Uzbekistan, there are enough works dedicated to the study of the regional characteristics of the spread, epidemiology and prevention of ZTL. However, these works were mainly carried out in the 70s and 80s of the last century.

REFERENCES

- [1] M. A. Medhat, "Clinical and epidemiological characterization of eosinophilic ascites in Egypt: a single center experience," *Egyptian Liver Journal*, vol. 14, no. 1, 2024, doi: 10.1186/s43066-024-00329-4.
- [2] M. A. Mohamed, "Epidemiological investigation of dengue fever outbreak and its socioeconomic determinants in Banadir region, Somalia," *BMC Infect Dis*, vol. 24, no. 1, 2024, doi: 10.1186/s12879-024-09276-2.
- [3] M. Wang, "Why Do Herdsmen Not Support Deratization? A Survey on the Awareness of Rodent Control in the Tibetan Areas of Sichuan Province, China," *Pak J Zool*, vol. 55, no. 5, pp. 2377-2384, 2023, doi: 10.17582/journal.pjz/20220311090338.
- [4] M. Pajić, "Molecular Investigation of *Eimeria* Species in Broiler Farms in the Province of Vojvodina, Serbia," *Life*, vol. 13, no. 4, 2023, doi: 10.3390/life13041039.
- [5] Y. Mao, "Additive interaction between birth asphyxia and febrile seizures on autism spectrum disorder: a population-based study," *Mol Autism*, vol. 15, no. 1, 2024, doi: 10.1186/s13229-024-00596-3.

- [6] L. Yuqiong, "Monitoring results of plague vector fleas in Yulong , Yunnan Province from 2019 to 2021," *Shanghai Journal of Preventive Medicine*, vol. 35, no. 9, pp. 879–884, 2023, doi: 10.19428/j.cnki.sjpm.2023.22853.
- [7] A. R. Parhizkar, "Comparing the efficacy of fluconazole and cryotherapy Versus cryotherapy alone on treating cutaneous leishmaniasis: a triple-blind randomized clinical trial," *BMC Infect Dis*, vol. 24, no. 1, 2024, doi: 10.1186/s12879-024-09211-5.
- [8] A. P. Pivotto, "Topical application of ozonated sunflower oil accelerates the healing of lesions of cutaneous leishmaniasis in mice under meglumine antimoniate treatment," *Med Microbiol Immunol*, vol. 213, no. 1, 2024, doi: 10.1007/s00430-024-00788-x.
- [9] B. Hagos, "Retraction to: 'Self-stigma' of people with cutaneous leishmaniasis the unrecognized one: what do we think; what do we know; what can we prove? (International Journal for Equity in Health, (2023), 22, 1, (180), 10.1186/s12939-023-01998-0)," *Int J Equity Health*, vol. 23, no. 1, 2024, doi: 10.1186/s12939-024-02108-4.
- [10] J. Mrázek, "Effects of Leishmania major infection on the gut microbiome of resistant and susceptible mice," *Appl Microbiol Biotechnol*, vol. 108, no. 1, 2024, doi: 10.1007/s00253-024-13002-y.
- [11] K. A. P. Diel, "Antiprotozoal potential of Vismia species (Hypericaceae), medicinal plants used to fight cutaneous leishmaniasis," *J Ethnopharmacol*, vol. 328, 2024, doi: 10.1016/j.jep.2024.118028.
- [12] J. C. R. Fernandes, "Early Leishmania infectivity depends on miR-372/373/520d family-mediated reprogramming of polyamines metabolism in THP-1-derived macrophages," *Sci Rep*, vol. 14, no. 1, 2024, doi: 10.1038/s41598-024-51511-y.
- [13] M. Sajid, "Multi-targeting derivatives of (±)-aminoglutethimide: Synthesis, anti-leishmanial, cytotoxicity against cancerous cells and molecular docking studies," *J Mol Struct*, vol. 1305, 2024, doi: 10.1016/j.molstruc.2024.137696.
- [14] M. O. Tuichieva and ..., "Risk Factors for the Development of Diseases in Old Age and their Prevention," ... *Journal of Trauma ...*, 2023, [Online]. Available: <http://journals.academiczone.net/index.php/rjtds/article/view/644>
- [15] M. O. Tuichieva, L. K. Elmurodova, and K. B. Rasulovna, "The Main Age-Related Diseases and Conditions Common among Elderly Men and Women," *Scholastic: Journal of Natural and ...*, 2023.
- [16] L. X. qizi Elmurodova, "SUVNI KOAGULYATSIYA QILISHNING GIGIYENIK AHAMIYATI," *GOLDEN BRAIN*, 2023, [Online]. Available: <https://researchedu.org/index.php/goldenbrain/article/view/5194>
- [17] O. T. Мусаева, Л. X. Элмуродова, and ..., "Старение Как Область Научных Исследований И Организация Гериатрической Медицинской Помощи," ... *Asian Journal of ...*, 2023, [Online]. Available: <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1420>
- [18] B. E. To'Xtarov and M. A. Q. Nomozboyeva, "DEVELOPMENT OF MEASURES TO PREVENT THE SPREAD OF HYMENOLEPIDOSIS IN UZBEKISTAN," *Scientific progress*, 2023, [Online]. Available: <https://cyberleninka.ru/article/n/development-of-measures-to-prevent-the-spread-of-hymenolepidosis-in-uzbekistan>
- [19] B. E. Tuxtarov, L. O'ZBEKISTONDA, T. OLDINI, and ..., "Scientific progress. 2023. № 2," ... : <https://cyberleninka.ru/article/n/o....>
- [20] U. F. B. o'g'li, "STREPTOKOKK AVLODLARIDAGI (STREPTOCOCCUS MUTANTS, STREPTOCOCCUS VIRIDANS, VEYLONELLA) BAKTERIYALARINING OG'IZ BO'SHLIG'IGA TA' ...," *Научный Фокус*, 2024, [Online]. Available: <http://nauchniyimpuls.ru/index.php/sf/article/view/14907>
- [21] L. X. qizi Elmurodova, B. F. Mahammadiyev, and ..., "ICHIMLIK SUVINI SAMARALI ZARARSIZLANTIRISH USULLARI," *GOLDEN ...*, 2024, [Online]. Available: <https://researchedu.org/index.php/goldenbrain/article/view/6064>
- [22] S. M. M. o'g'li and A. Marjona, "UMUMIY OVQATLANISH KORXONALARIDA FOYDALANILADIGAN JIHOZLARGA QO'YILADIGAN GIGIYENIK TALABLAR," ... *JOURNAL OF RECENTLY ...*, 2024, [Online]. Available: <https://uzresearchers.com/index.php/ijrs/article/view/2023>

- [23] O. Musayeva, M. Nomozboyeva, and ..., "FEATURES OF PROVIDING MEDICAL CARE TO ELDERLY AND SENILE CITIZENS," ... журнал медицинских и ..., 2023, [Online]. Available: <https://in-academy.uz/index.php/EJMNS/article/view/10649>
- [24] N. Maftuna, *GIMENOLEPIDOZNING TARQALGANLIGI VA UNING PROFILAKTIK CHORA-TADBIRLARINI TAKOMILLASHTIRISH.* involta.uz, 2022. [Online]. Available: <https://www.involta.uz/index.php/iv/article/view/59>
- [25] M. O. Tuichievna and ..., "Risk Factors for the Development of Diseases in Old Age and their Prevention," ... *Journal of Trauma* ..., 2023, [Online]. Available: <http://journals.academiczone.net/index.php/rjtds/article/view/644>
- [26] O. T. Мусаева, М. А. Номозбоева, and ..., "ФАКТОРЫ РИСКА ПРИ ВОЗРОСТНЫХ ЗАБОЛЕВАНИЙ И ИХ ПРОФИЛАКТИКА," *European Journal of* ..., 2023, [Online]. Available: <http://ejird.journalspark.org/index.php/ejird/article/view/450>
- [27] B. E. To'Xtarov and M. A. Q. Nomozboyeva, "DEVELOPMENT OF MEASURES TO PREVENT THE SPREAD OF HYMENOLEPIDOSIS IN UZBEKISTAN," *Scientific progress*, 2023, [Online]. Available: <https://cyberleninka.ru/article/n/development-of-measures-to-prevent-the-spread-of-hymenolepidosis-in-uzbekistan>
- [28] O. T. Мусаева, М. А. Номозбоева, and ..., "Медицинская Помощь Для Людей Пожилого И Старческого Возраста В Узбекистане," *Research Journal of* ..., 2023, [Online]. Available: <http://journals.academiczone.net/index.php/rjtds/article/view/1309>
- [29] B. E. Tuxtarov and L. X. Q. Elmurodova, "O'ZBEKISTONDA TERI LEYSHMANIOZINING TARQALISHI VA UNING OLDINI OLISH CHORA-TADBIRLARI," *Scientific progress*, 2023, [Online]. Available: <https://cyberleninka.ru/article/n/o-zbekistonda-teri-leyshmaniozining-tarqalishi-va-uning-oldini-olish-chora-tadbirlari>
- [30] U. F. B. o'g'li, "BOLALARDA QANDLI DIABET KASALLIGINI UCHRASHI, SABABLARI VA PROFLAKTIKASI," *JOURNAL OF INNOVATIONS IN* ..., 2024, [Online]. Available: <https://bestpublication.org/index.php/jaj/article/download/9908/9957>