

REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

IMPROVEMENT OF THE EPIDEMIOLOGICAL CONTROL
SYSTEM IN THE FOCIES OF LEISHMANIASIS IN THE
TERRITORY OF THE REPUBLIC OF AZERBAIJAN IN
MODERN TIME

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THE ACTUALITY OF THE SUBJECT

In modern times, leishmaniasis is one of the most epidemiologically significant pathologies among infectious diseases. According to the World Health Organization, leishmaniasis has been registered in 88 countries of the new and old world (66 new world, 22 old world). Of these, 72 are developing countries, 13 of which are among the world's poorest. Visceral leishmaniasis has been reported in 65 countries [Desjeux P]¹. 90% of cases of visceral leishmaniasis occurred in India, Bangladesh, Nepal, Sudan, Ethiopia and Brazil². In 2010, 52,000 people died of visceral leishmaniasis [Lozano R and oth.]³. Cutaneous leishmaniasis is most prevalent in Afghanistan, Algeria, Brazil, Colombia, and Iran, while mucosal leishmaniasis is most prevalent in Bolivia, Brazil, and Peru⁴.

Leishmaniasis is widespread in countries with subtropical and tropical climates². Leishmaniasis is the most common parasitic disease in the world after malaria. Every year, 2 million people are infected with leishmaniasis worldwide, of which about 1.5 million are skin and 500,000 are vesicular leishmaniasis. 350 million people are at risk of contracting leishmaniasis. [Desjeux P and oth.]⁵. Of the 1.3 million cases of visceral leishmaniasis in recent years, 20,000 to 30,000 have resulted in death. However, these figures do not allow to accurately assess the epidemiological situation of the problem. Because it was not possible to register all patients in the areas where leishmaniasis is widespread⁵.

1.Desjeux P.Leishmaniasis: current situation and new perspectives// Comparative Immunology, Microbiology and Infectious Diseases, 2004, vol 305 p.18

2.Доклад на заседании Комитета экспертов ВОЗ по борьбе с лейшманиозом, Женева, 22–26 марта 2010 года. стр.1- 32

3.Lozano R. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010 // Lancet., 380 (9859): 2095, 2012, p.2105

4. Leishmaniasis Fact sheetN375//World Health Organization, January 2014, p.22

5.Desjeux P. The increase in risk factors for leishmaniasis worldwide // Med. Microbiol. Immunol. (Berl), 2001, vol 190, No 1-2, p.77-79

Only 33 of these countries have a high level of disease registration. In all cases, if active detection will done in endemic countries, a higher incidence of the disease reveals. [Alvar J., Vélez I.D. and Desluex P.]^{6,7}.

Leishmaniasis causes a variety of pathologies in human society and among animals, from cutaneous lesions to visceral forms resulting in death. This feature indicates that they have a special relevance among invasive diseases.

Lack of effective treatment methods, insufficient measures to combat parasitic diseases, changes in the immune structure of the population against these diseases, changes in the natural-climatic and socio-economic conditions also lead to serious changes in the epidemiological condition of the leishmaniasis. The study of these changes has helped us to increase the effectiveness of anti-epidemic measures against leishmaniasis. For this reason, we have extensively studied the history of study of leishmaniasis, its etiological structure, clinical forms, and the level of its prevalence in the world.

Recently, 50-100 cases of leishmaniasis have been registered in Azerbaijan every year. There are favorable geographical and climatic conditions for the spread of leishmaniasis in Azerbaijan. Despite the abolition of leishmaniasis in Azerbaijan in 1966, leishmaniasis occurred again in 1987-1989. Both cutaneous and visceral forms of the disease are noted sporadically in non-endemic areas of the country. Between 2009 and 2013, 256 patients with leishmaniasis were identified. 158 of them are infected with cutaneous and 98 with visceral leishmaniasis. In general, endemic areas of leishmaniasis, as well as sporadically detected regions, cover a wide geography throughout the country. For example, visceral leishmaniasis was detected in 8 cities and districts of the country in 2009, in 11 cities and districts in 2013, in 13 cities and districts in 2015, and in 20 cities and districts in 2016.

6.Desluex P. The increase in risk factors for leishmaniasis worldwide // Trans R. Soc. Trop. Med. Hyg., 2001 vol 95, p.239-243

7.Alvar J., Vélez I. D. WHOleishmaniasis Control Team. "Leishmaniasis worldwide and global estimates of its incidence"//PLoS One, 2012, vol 7(5), p.671

Statistically, cases of cutaneous leishmaniasis are more common than cases of visceral leishmaniasis. There are endemic foci of cutaneous leishmaniasis in Goychay, Agdash, Ujar, Ismayilli and other regions. In general, cases of leishmaniasis are recorded sporadically in other regions of Azerbaijan in different years. Leishmaniasis is mainly observed in the population of all age groups. Although some work has been done in the field of diagnosis of leishmaniasis in the last 10-15 years, the epidemiology of leishmaniasis has not been studied in our country since 1990, although cases have been registered.

The purpose of the study was to study the characteristics of the outbreak of leishmaniasis in the territory of the Republic of Azerbaijan on the basis of retrospective data for 2000-2016 and to improve the system of anti-epidemic measures.

Research objectives

1. To analyze the time and space dynamics of infectious foci during 2000-2016 on the basis of the obtained literature and statistics.
2. To analyze the structure of the disease by sex and age.
3. To determine changes in the intensity of all clinical forms in endemic and sporadic foci.
4. To study the nosocography of Phlebotomus in Azerbaijan.
5. Improving the system of anti-epidemic measures against the disease.

Scientific novelty of the research

- For the first time since independence in the territory of the Republic of Azerbaijan in modern conditions, epidemiological monitoring of both forms of leishmaniasis was conducted;
- Epidemiological features of new foci of leishmaniasis in the territory of Azerbaijan in 2000-2016 were studied;
- The most effective seroepidemiological examination methods used in the epidemiological monitoring and diagnosis of visceral leishmaniasis were compared;
- The most effective insecticides have been identified against sandfly (which are considered live carriers of leishmaniasis) in living areas;

- Actual and probable invasive reservoirs among animals in foci of visceral leishmaniasis have been identified.

Practical significance

Taking into account the biological and geographical features of sandfly, which are the live vectors of leishmaniasis, the effective organization of disinsection measures against them and the application of 25% cypermethrin in settlements allows to increase the effectiveness of disinsection.

The use of immunochromatographic anti-rk39 tests, which are the cheapest and do not require any laboratory conditions for use, and show high specificity and sensitivity facilitate the diagnosis of the disease in the sero-epidemiological examination of visceral leishmaniasis.

Given that *L. tropica* can also cause visceral leishmaniasis in children 0-1 years of age, there is a need to strengthen anti-epidemic measures by Republic Hygiene and Epidemiology Center and regional Hygiene and Epidemiology Center in the foci of cutaneous leishmaniasis.

Publication of results. The main results of the dissertation were published in 11 scientific articles, 8 of which were published in scientific and practical journals (1 Ukraine, 1 Belarus, 1 India) and 3 in (1 in Poland) in conference proceedings as the thesis.

The scope and structure of the dissertation. The dissertation consists of five chapters, 144 pages, "Literature Review", "Materials and Methods" and chapters devoted to special research, conclusions, results, practical recommendations and a list of references. The bibliography includes 202 sources (152 of them in English). The work was explained with 14 tables and 30 figures.

Provisions for the presentation:

- Assessment of the epidemiological situation of leishmaniasis in different economic and geographical regions of the Republic of Azerbaijan in modern times and epidemiological analysis of invasive foci
- Results of the study of the components of the epidemic process in both forms of leishmaniasis - sources of infection, live vectors and susceptible individuals

- Results and recommendations on the components of anti-epidemic measures against leishmaniasis
- Identify the most effective serological methods for seroepidemiological study of leishmaniasis
- New research hypotheses

Approval and application of the dissertation: Dissertation materials were discussed at the meeting of the Problem Commission on the departments of the Microbiology, Immunology, Epidemiology and Infectious Diseases in the Azerbaijan Medical University (Baku 2016, 2017),

At the initial discussion meeting of Faculty of Public Health of the Azerbaijan Medical University (Baku-2018), at the scientific seminar of the Dissertation Council FD 2.28 at the Azerbaijan Medical University (Baku 2021)

The results obtained from the dissertation are intended to be applied in the practical activities of the regional Centers of Hygiene and Epidemiology of the Republic in the field of control of parasitic diseases and in the curriculum of medical educational institutions, in teaching the subject "Medical Parasitology".

The content of the dissertation

Materials and methods. Basically, epidemiological, biostatic, laboratory, examinations were conducted. Microscopic, bacteriological, serological, entomological, experimental examination methods were used in the laboratory. The tests were performed on humans, insects and domestic animals, synanthropic and wild animals that are considered a source of infection. Most of the research was conducted in Absheron, Ganja-Gazakh, Aran economic regions. The population groups involved in the examinations are as follows: 1. Patients; 2. Suspected persons living in endemic foci and areas close to sporadic foci; 3. Healthy individuals living in endemic foci and areas close to sporadic foci. In bacteriological examinations and experiments, materials were taken from rabbits, guinea pigs, synanthropic rodents and wild mammals, and sandflies. Wound

contents of patients with cutaneous leishmaniasis, sternum and venous blood of patients with visceral leishmaniasis, venous blood of healthy and cured individuals, wound contents of rodents and mammals and venous blood of slaughtered rodents and mammals, spleen samples of wild mammals, blood samples sucked together with the contents of the abdominal cavity taken from the sandfly were obtained for microscopic, bacteriological, serological and experimental examinations.

We had done research within two years in the Absheron, Ganja-Gazakh, Aran economic regions among the population living in different regions of Azerbaijan to determine the epidemiological characteristics of leishmaniasis, the demographic characteristics of the affected population, the etiology of the diseases, the diversity of clinical course, the characteristics of the main and additional sources of infection, the geography of the sandflies. 993 people, 45 farm animals, 224 rodents, 102 dogs, of about 18,110 sandfly samples were examined in the research. 28 rabbits and 14 guinea pigs had been used in the study. The light traps, exhausters, entomological needles, microscopes and express "Elisa" tests were used in the research to study the epidemiological, geographical and biological characteristics of the sandfly.

Serological testing methods are widely used in the diagnosis of visceral leishmaniasis. Therefore, in the acute stage of the disease, a sufficient amount of antibodies accumulate in the human serum. Serological methods such as ELISA, IFA, direct agglutination reaction (DAT) are widely used in the detection of antibodies to parasites. However, these methods are also highly sensitive to trypanosomes and mycobacteria. Seroepidemiological examinations used enzyme-linked immunosorbent assay (ELISA), immunochromatographic anti-k39 rapid tests, and rapid canine-Elisa tests among animals.

Results of special researches. The research was conducted in different economic regions of Azerbaijan in 2015-2016, when leishmaniasis was most prevalent. Geographical-biological and epidemiological features of sandflies were studied in Shamkir,

Goranboy, Tartar regions, where visceral leishmaniasis was more prevalent, and in Agdash and Goychay regions, where cutaneous leishmaniasis was more prevalent. When studying the seasonal dynamics of the Huns, it became clear that the seasonal dynamics of the sandflies in Shamkir and nearby regions due to geographical and climatic conditions begins in early June and ends in mid-September. Observing the seasonal dynamics of sandflies between species, it is clear that the number intensity of some species reaches a maximum at certain times of the year. The most common *Phlebotomus candelaki* occurs mainly twice a year, in late June and late August, and *Phlebotomus transcausicus* reaches its maximum in mid-August. In Goranboy and Tartar regions, the seasonal dynamics begins in late May and ends in mid-September. The number of *Phlebotomus kandelaki* and *Phlebotomus transcausicus* reaches a maximum once a year in mid-July. Research works on cutaneous leishmaniasis centers were carried out in Ashagi Laki, Bulagotaghi, Garabaggal, Garamaryam villages of Agdash region, Goychay region. Since these regions are located in the same geographical region, in the Shirvan plain at the foot of the Greater Caucasus mountain range, the observations made when determining the seasonal dynamics had the same result. It was found that the seasonal activity of sandfly gradually begins to increase in the first decade of May and reaches a maximum in August. After the second decade of October, the dynamics of the sandflies' flight is not observed. The increasing of seasonal dynamics for *Ph.caucasicus*, *Ph.sergenti* and *Ph.papatasi* occur at almost the same intensity. The highest collection points were found in Shamkir district in the yards of houses $16.48 \pm 0.73\%$ (310), animal and chicken roofs $11.70 \pm 0.54\%$ (220), rooms $8.56 \pm 0.54\%$ (160), basements $9.04 \pm 0.43\%$ (170), near soil cracks $13.82 \pm 0.79\%$ (260), in cracks in pine $15.42 \pm 0.83\%$ (290), $7.44 \pm 0.60\%$ (140) fir and poplar stumps, in vineyards, $17.02 \pm 0.75\%$ (320) near rodent and jackal nests, $55.30 \pm 1.09\%$ (1250) in the yards of houses in Goranboy region, $34.51 \pm 1\%$ (780) on the roof of animals and chickens, $5.75 \pm 0.48\%$ (130) in the room, $4.42 \pm 0.18\%$ (100) in the basement, $34.12 \pm 0.94\%$ (860)

in soil cracks, under rocks and rocks, $40.87 \pm 0.97\%$ (1030) near tree stumps, $25 \pm 0.86\%$ (630) near wildlife nests, $29.78 \pm 0.94\%$ (700) in soil cracks in Tartar region, $23.40 \pm 0.87\%$ (550) among densely vegetated grasses, $46.80 \pm 1.02\%$ (1100) in rodent and jackal nests, In Agdash and Goychay districts, $33.24 \pm 0.75\%$ (128 0) in basements, $20 \pm 0.64\%$ (770) in greenhouses, $25.19 \pm 0.69\%$ (920) in rooms, $14.28 \pm 0.55\%$ (550) on roofs, $8.57 \pm 0.44\%$ (330) in the funnel.

When determining the species composition of sandflies, it was found that the species composition of sandflies in Shamkir region is as follows: $43.72 \pm 1.05\%$ (975) *Phlebotomus candelaki*, $41.25 \pm 1.04\%$ (920) *Phlebotomus transcaucasicus*, $10,31 \pm 0.64\%$ (230) *Phlebaotomus tobbi*. It was not possible to determine the type of $4.70 \pm 0.44\%$ (105). The species composition of sandflies in Goranboy region is as follows: $38.52 \pm 0.71\%$ (1772) *Phlebotomus candelaki*, $43.71 \pm 0.73\%$ (2011) *Phlebotomus transcaucasicus*, $15.45 \pm 0.53\%$ (711) *Phlebaotomus tobbi*. It was not possible to determine the type of $2.30 \pm 0.22\%$ (105). *Ph.kandelaki*, *Ph.tobbi*, *Ph.transcaucasicus*, *Ph.papatasi*, *Ph.sergenti* species of sandflies were observed in Tartar region. The species composition of sandflies in and outside settlements of Tartar region is as follows: $37.75 \pm 0.69\%$ (1850) *Phlebotomus candelaki*, $21.42 \pm 0.34\%$ (1050) *Phlebotomus transcaucasicus*, $18.36 \pm 0,30\%$ (900) *Phlebaotomus tobbi*, $8.24 \pm 0.15\%$ (400) *Ph.papatasi*, $10.20 \pm 0.43\%$ (500) *Ph.sergenti*, $4.08 \pm 0,28\%$ (200) It was not possible to determine the type of sandflies. The species composition of sandflies found in Agdash and Goychay regions is as follows: $45.84 \pm 0.8\%$ (1765) of *Ph.papatasi*, $15.53 \pm 0.58\%$ (598) of *Ph.sergent* and $24,28 \pm 0.68\%$ (552) *Ph.transcaucasicus*. $14.33 \pm 0.55\%$ (935) of the samples were not possible to determine the type of sandflies.

The type composition of sandflies in the foci of cutaneous leishmaniasis is somewhat different from that in the foci of visceral leishmaniasis. For example, the number of *Ph.papatasi* and *Ph.sergenti* in these centers is higher. This increases the epidemiological danger of sandflies in these areas. Because

Ph.papatasi belongs to permissive sandflies. It can carry not only one type of parasite, but also several types of parasites. A second danger is that ph.papatasi females can suck blood several times during the egg-laying phase.

The various insecticides and the sensitivity of sandflies to them have been compared for investigate more effective methods of combating sandflies. The research was conducted in Shamkir region. Cypermethrin and deltamethrin were used for the study. 100% result was obtained with 25% and 35%, and 80% result with 15% cypermethrin solution. The effect lasts 3-4 weeks after use. 60% result was obtained in 1% and 2.5% solutions of deltametrine, and 80% in 3.5% deltametrine. The effect lasts 1-2 weeks after use. These studies have shown that sandflies are more sensitive to cypermethrin than deltametrine, less toxic to humans, have a longer duration of action than other pyrethroids, and thats why the use of 25% cypermethrin for residential areas is more appropriate. In non-residential areas, such as large basements, ruins, and non-residential buildings, it is more appropriate to use more aggressive insecticides as 2-4% malation solution. Because after the use of this solution 100% lethality was achieved and the effect lasted 3-5 months.

The detection of cutaneous and visceral leishmaniasis and their age and sex intensity examined in different economic regions of the Republic of Azerbaijan in 2000-2016.

Of the 359 patients registered in the country in 2000-2016, $7.79 \pm 0.20\%$ (28 cases) were detected in the Absheron economic-geographical region. $71.42 \pm 8.53\%$ (20 cases) was in Baku city (6 cases ($30 \pm 10.24\%$) Khatai, 9 cases ($45 \pm 11.12\%$) Sabunchu, 4 cases ($20 \pm 8.94\%$) Yasamal, 1 cases ($5 \pm 1.11\%$) Binagadi), $21.42 \pm 7.75\%$ (6 cases) was in Sumgayit city, $7.14 \pm 0.84\%$ - i (2 events) took place in the territory of Absheron region. $21.42 \pm 7.75\%$ (6 cases) of morbidity were registered in 2015-2016, of which $66.67 \pm 19.24\%$ (4 cases) occurred in Baku (two in Khatai and two in Sabunchu district), $33.33 \pm 19.24\%$ (2 incidents) occurred in Absheron district.

Among the patients in 2000-2016, 9 cases ($32.14 \pm 8.82\%$) were among 0-1 years old people, 13 cases ($46.42 \pm 9.42\%$) were 1-4 years old, and 4 cases ($14.28 \pm 6.61\%$) 5-13 years, 3 cases ($10.71 \pm 5.84\%$) belong to the age group over 18 years. 20 patients ($71.42 \pm 8.53\%$) were male and 8 ($28.57 \pm 8.53\%$) were female.

In the Baku-Absheron economic geographical region, cutaneous leishmaniasis was regularly registered in 2000-2016. During these years, $12.14 \pm 1.94\%$ (34 cases) of the total incidence of cutaneous leishmaniasis occurred in this zone. Approximately $91.17 \pm 4.86\%$ of cases (31 cases) in Baku, $5.88 \pm 0.84\%$ (2 cases) in Absheron, $2.94 \pm 0.78\%$ (1 case) in Sumgayit has happened. When determining the intensity of the disease according to the age groups of the population, it is found that $20.58 \pm 6.93\%$ of the cases (7 cases) are 1-4 years old, $20.58 \pm 6.93\%$ (7 cases) are 5-13 years old, $23.52 \pm 7.27\%$ (8 cases) were registered among 14-17 year old, $35.29 \pm 8.19\%$ (12 cases) among 18-year old age groups. Looking at the time and space dynamics of morbidity in this economic region, it is clear that although morbidity was not recorded in the early 2000s, it was recorded sporadically between 2004 and 2016 (excluding 2014). In recent years (2013-2016), the cases occurred mainly in Yasamal, Sabunchu, Binagadi districts of Baku, Khirdalan city (Sh. Ahmadzadeh Street) of Absheron district and Sumgayit city. When calculating the dynamic range for 2000-2016, it was found that a dynamic decrease was observed in 2007, 2008, 2010, 2012, 2013, and an increase in the dynamic pace was observed in 2004, 2009, 2011, 2014, 2016.

Recently, the role of Ganja-Gazakh economic-geographical region has been great in increasing the urgency of visceral leishmaniasis in the country. Because, according to retrospective indicators and data obtained as a result of current research, $35.38 \pm 2.52\%$ (127 cases) of visceral leishmaniasis cases registered in 2000-2016 occurred in this zone. Of this, $32.28 \pm 4.14\%$ (41 events) were in Shamkir, $30.70 \pm 4.09\%$ (39 events) were in Gazakh ($t = 0.04$, $p > 0.50$), $12.59 \pm 2.94\%$ (16 cases) were in Tovuz ($t = 3.59$; $p < 0.05$), $10.23 \pm 2.68\%$ (13 cases) were in Agstafa ($t = 0.59$; $p < 0.50$), 8.66

$\pm 2.49\%$ (11 events)) were in Goranboy ($t = 0.42$; $p = 0.50$), $3.14 \pm 0.42\%$ (4 events)) were in Ganja ($t = 0.64$; $p > 0.5$), $1.57 \pm 0.31\%$ (2 cases)) were in Goygol ($t = 0.83$; $p < 0.40$), $0.78 \pm 0.78\%$ (1 event) occurred in the territory of Samukh region ($t = 0,43$; $p > 0,5$). Looking at the intensity of the disease, it is determined that the highest number of cases occurred in 2007, 2010, 2015, 2016. The incidence of morbidity in the region was studied according to some demographic characteristics of the population (age, sex) and it was found that $62.99 \pm 4.28\%$ (80 cases) of patients were men, $37 \pm 4.28\%$ (47 cases)) ($t = 4.29$; $p = 0.002$) are women. When grouped by age, it was found that $49.60 \pm 4.43\%$ of patients (63 cases) were children aged 1-4 years, $20.47 \pm 3.57\%$ (26 cases) were children aged 0-1 years ($t = 5.11$; $p < 0.001$), $18.11 \pm 3.41\%$ (23 cases) Children aged 5-13 years ($t = 0.47$; $p > 0.50$), $7.08 \pm 2.27\%$ -i (9 cases) adolescents aged 14-17 years ($t = 2.69$; $p > 0.02$), $4.72 \pm 1.88\%$ (6 cases) over 18 years ($t = 0.80$; $p < 0.50$) occurred among people belonging to the age group. It was found that $88.18 \pm 2.86\%$ (112 cases) of cases were registered among children under 14 years of age. 22 people died as a result of the disease.

$2.85 \pm 0.26\%$ (8 cases) of the total number of registered cases of cutaneous leishmaniasis were registered in this region. The cases were registered mainly in Ganja city, Gazakh, Tovuz and Shamkir districts. $62.50 \pm 17.11\%$ (5 cases) of patients are women, $37.5 \pm 17.11\%$ (3 cases) are men, of which $12.5 \pm 1.97\%$ (1 case) were in 1-4 years old, $25 \pm 6.84\%$ (2 events) were in 5-13 years old, $12.5 \pm 1.97\%$ (1 event) were in 14-17 years old, $50 \pm 17.67\%$ (4 event) falls on the age group over 18 years.

When calculating the dynamic rate in Ganja-Gazakh region, it was found that the most dynamic increase in visceral leishmaniasis belongs to 2010 and 2015. When looking at cutaneous leishmaniasis, it was found that in 2000-2016, the incidence of this disease in the region was recorded sporadically in 2003, 2006, 2007, 2008, 2010, 2014, 2016. Dynamic growth was observed only in 2016.

During 2000-2016, $3.89 \pm 1.01\%$ (14 cases) of visceral leishmaniasis were registered in Nagorno-Karabakh. No cases of visceral leishma-

niasis were reported in these areas between 2000 and 2013. During 2014-2016, 14 cases were registered, of which about $85.71 \pm 9.35\%$ (12 cases) were in Tartar and $14.28 \pm 2.08\%$ (2 cases) were in Aghdam regions. $64.28 \pm 12.80\%$ (9 people) of patients are women and $35.72 \pm 12.80\%$ (5 people) are men. $21.42 \pm 10.96\%$ (3 cases) of patients were children aged 0-1 years, $78.58 \pm 10.96\%$ (11 cases) were children aged 1-4 years. The diseases were registered mainly in Bayimsarov, Evoglu, Qaynaqli, Duyerli, Kocharli, Borsunlu, Gafanli, Poladli, Kabirli, Imamgulubeyli villages of Tartar region. Most of the mentioned areas are located near Barda and Goranboy districts, and in recent years the incidence of leishmaniasis has been increasing in these districts as well. No cases of cutaneous leishmaniasis were registered in this region during 2000-2016.

Studies have shown that the Aran economic region is the most epidemiologically important for both forms of leishmaniasis. Between 2000 and 2016, $15.59 \pm 1.91\%$ of cases (56 cases) of visceral leishmaniasis occurred in this region. In 2015-2016, diseases were registered in Aran economic region in Nehrakhalil, Gurjuva villages of Agdash region, in Parioglular village of Agjabedi region, in Lamberan, Ugurbeyli, Jumalar, Korpusindiran, Zumurkhaj, Lak villages of Barda region, in Ashagi Salmanabad of Yevlakh region, in Gazigumlag village of Ujar region, in Bıgır village of Goychay region and in the Kurdamir city. As it is known, the highest number of cases was registered in Barda, Agdash and Goychay districts. The intensity of the disease increases sharply from 2010 to 2016. The highest number of cases was registered in 2016, which is about 20% of the total number of patients. $66.07 \pm 6.32\%$ (37 cases) of patients were 1-4 years old age group population, $25 \pm 5.78\%$ (14 cases) were among 0-1 years old ($t = 4.79$; $p < 0.002$), $7.14 \pm 3.43\%$ (4 cases) were among 5-13 years old ($t = 2.65$; $p < 0.02$), $1.79 \pm 0.50\%$ (1 case) over 18 years old ($t = 1.38$; $p < 0.20$) population groups, of which $53.57 \pm 6.66\%$ (30 people) are women, $46.43 \pm 6.66\%$ ($t = 1.07$). ; $p = 0.30$) (26 people) consists of men.

The highest incidence of cutaneous leishmaniasis was reported in this area. Of the 280 patients registered between 2000 and 2016,

57.71 ± 2.95% (160 people) occurred in the Aran economic region. Approximately 34 ± 3.74% of cases (54 cases) were reported in 2015/16. During 2000-2016, no cases of skin leishmaniasis were registered in Mingachevir city, Bilasuvar, Neftchala, Sabirabad, Salyan districts of Aran economic region. 41.25 ± 3.89% (66 cases) of patients were Aghdash, 32.5 ± 3.70% (52 cases) ($t = 1.62$; $p > 0.20$) were in Goychay, 13.75 ± 2.72% (22 cases) ($t = 4.08$; $p < 0.001$) were in Shirvan, Agjabadi, Beylagan, Hajigabul, Imishli, Kurdamir, Saatli, Yevlakh, Zardab districts, 6.87 ± 1.99% (11 cases) ($t = 2.04$; $p < 0.05$) were in Barda, 5.62 ± 1.81% (9 cases) ($t = 0.46$; $p < 0.50$) occurred in Ujar regions. The highest number of cases was registered in 2010-2016. 56.87 ± 3.91% (91 cases) of patients were over 18 years old, 16.87 ± 2.95% (27 cases) were 5-13 years old ($t = 8.16$; $p < 0.001$), 15.62 ± 2.86% (25 cases) were 14-17 years ($t = 0.30$; $p > 0.50$), 6.25 ± 1.91% (10 cases) were 1-4 aged ($t = 2.72$; $p < 0.02$), 4.37 ± 1.61% (7 cases) were in population groups aged 0-1 ($t = 0.75$; $p < 0.50$), of which 73.75 ± 3.47% (118 cases) were men and 26.25 ± 3.47% (42 cases) were women ($t = 9.67$; $p = 0.01$). Diseases are usually registered in Khosrov, Nehrakhalil, Garaman Shikhlar, Shekili, Garadagli, Tofigi, Garibli, Shikhli, Kotanarkh, Gurjuva, Agali, Goshagovag villiges of Agdash region and Goychay city, Bigir, Ulashli Shikhli, Chayarkhi, Yeniarkha, Yeniarkha villages of Goychay region. Looking at the dynamic pace of visceral leishmaniasis, it is clear that in recent years there has been an increase. In 2008, 2010, 2012, 2016, this is even more pronounced. In 2006, 2009, and 2013, a decrease in the dynamic pace was observed. The highest number of visceral leishmaniasis cases was registered in 2016. In the course of the dynamic pace of cutaneous leishmaniasis, with the exception of 2009, 2012, 2013, a dynamic increase was observed. The most significant dynamic growth was observed in 2011 and 2016.

In the mountainous Shirvan region, the incidence of visceral leishmaniasis was registered only in Agsu (54.54 ± 10.61%) and Shamakhi (45.45 ± 10.61%) districts during 2000-2016. Outbreaks were registered in Sabir, Shirvan, Muganli villages of Shamakhi

region, Arabsarvan and Padar villages of Agsu region. During these years, this region accounted for $6.12 \pm 1.26\%$ (22 cases) of the total incidence of visceral leishmaniasis. The highest number of cases was registered in 2008. The incidence of the disease has decreased in this region since 2010. $13.63 \pm 7.31\%$ of patients (3 cases) were 0-1 years old, $81.81 \pm 8.22\%$ (18 cases) were 1-4 years old, $4.54 \pm 1.05\%$ (1 case) occurred among 14-17 year old population groups, of which $18.18 \pm 8.22\%$ (4 cases) were women and $81.82 \pm 8.22\%$ (18 cases) were men.

$3.57 \pm 1.10\%$ (10 cases) of the total morbidity due to cutaneous leishmaniasis occurred in the Mountainous Shirvan economic region, of which $70 \pm 14.49\%$ (7 cases) in Ismayilli, $20 \pm 12.64\%$ (2 cases) Agsu, $10 \pm 9.48\%$ (1 case) falls on Shamakhi regions. 30% of patients are women, 70% are men, of which $30 \pm 14.49\%$ (3 cases) 5-13 age group, $20 \pm 12.64\%$ (2 cases) 14-17 age group, $50 \pm 15.81\%$ (5 cases) fall on the age group over 18 years.

Although the dynamic rate of visceral leishmaniasis in the mountainous Shirvan region reached its peak in 2006 and 2013, a dynamic decrease was observed in other years. As for skin leishmaniasis, the disease was registered only in 2016 after 2010. The growth rate of both leishmaniasis was recorded in 2006-2007.

As a result of epidemiological studies, visceral leishmaniasis was registered in Sheki-Zagatala economic-geographical region in Sheki, Zagatala, Gakh, Gabala regions in 2000-2016, which accounted for $18.66 \pm 2.05\%$ of the total morbidity rate in the country (67 cases). $52.23 \pm 6.10\%$ of patients (35 cases) Zagatala, $35.82 \pm 5.85\%$ (24 cases) Sheki ($t = 1.94$; $p > 0.10$), $8.95 \pm 3.48\%$ (6 events) Gakh ($t = 3.94$; $p < 0.002$), $2.98 \pm 2.07\%$ (2 events) Gabala ($t = 1.47$; $p < 0.20$) were registered in the Sheki-Zagatala economic-geographical region. $55.22 \pm 6.07\%$ (37 cases) of patients were women, $44.77 \pm 6.07\%$ (30 cases) were men ($t = 1.21$; $p = 0.30$). in $64.17 \pm 5.85\%$ (43 cases) were 1-4 years, $19.40 \pm 4.83\%$ (13 cases) ($t = 5.85$; $p < 0.01$) were 0-1 age group, $7.46 \pm 3.20\%$ (5 cases) ($t = 2.04$; $p < 0.05$) were 5-13 age group, $5.97 \pm 2.89\%$ (4 cases) ($t = 0.34$; $p > 0.50$) were 14-17 age group, $2.98 \pm 2.07\%$ (2 cases) ($t = 0.83$; $p > 0.40$) were people over

18 years old. The highest incidence in the region was recorded in 2012. The intensity of the disease has increased since 2008. As a result of epidemiological research, it was found that the most visceral leishmaniasis was registered in 2015-2016 in Oba-Ali, Yukhari Tala, Bahmanli of Zagatala region, Ashagi Goynuk, Kichik Dahna, Bideyiz villages of Shaki region, Aydingishlag, Zalam, Kipchak villages of Gabala region and Kipchak village of Gakh region.

17.85±2.28%(50 cases) of the total number of cutaneous leishmaniasis cases were registered in Sheki-Zagatala economic region, of which 64 ± 6.78% (32 cases) were registered in Sheki, 14 ± 4.90% (t = 5.91; p> 0.001) (7 events) in Gabala, 14 ± 4.90% (t = 1.0; p> 0.30) (7 events) in Oguz, 6±3,35% (t = 1.33; p <0.20) in Zagatala (3 cases), 2±1.97% (t = 1.02: p <0.30) (1 case) in Gakh districts. 58 ± 6.97% (29 cases) of patients were women and 42 ± 6.97% (t = 1.60: p = 0.30) (21 cases) were men. When looking at morbidity by age group, it was found that 66 ± 6.69% of patients (33 cases) were over 18 years old, 20 ± 5.65% (t = 5.19; p <0.001) (10 cases) were among 1-4 age group, 8 ± 3.83% (t = 1.73; p> 0.10) (4 events) were among 5-13 age group , 6 ± 3.35% (t = 0.38: p <0.50) (3 cases) occurred among 14-17 age group population. When we look at the time and space dynamics of cutaneous leishmaniasis, we see that 68 ± 6.59% of cases (34 cases) occurred in 2013-2016. The dynamic growth rate of visceral leishmaniasis in the Sheki-Zagatala economic region reached its peak in 2015. In cutaneous leishmaniasis, the highest growth rate was observed in 2013.

In the Guba-Khachmaz economic-geographical region, visceral leishmaniasis is found, albeit in small amounts. Diseases were registered mainly in Siyazan, Shabran and Khachmaz regions. 3.34 ± 0.94% (12 cases) of the total morbidity registered this region, of which 66.66±13.60% (8 cases) are women, 33.33±13.60% (4 events) are men. Morbidity among population groups 16.66±10.75% (2 cases) were among 0-1 age group, 66.66 ± 13.60% (8 cases) were among 1-4 age group, 8.33 ± 7.97% (1 case) were among 14-17 age group, 8.33 ± 7.97% (1 case) occurred among those over 18 years of

age. The highest number of cases occurred in 2016 with a rate of 34%. In 2016, the disease was registered in H. Hajibiyov Street of Khachmaz city and Demiryol Street of Shabran city.

The incidence of cutaneous leishmaniasis in the Guba-Khachmaz economic region is $2.85 \pm 1.30\%$ (8 cases) of the total morbidity. $62.5 \pm 17.11\%$ (5 events) of cases arise in Khachmaz, $12.5 \pm 11.69\%$ (1 event) arise in Shabran, $25 \pm 15.30\%$ (2 events) arise in Gusar region. $50 \pm 17.67\%$ (4 cases) of patients are women. $25 \pm 15.30\%$ of cases (2 cases) were registered in 1-4, $75 \pm 15.30\%$ (6 cases) in the age group over 18 years. Most cases were recorded sporadically in 2002-2007. The incidence of both forms increased in 2006-2007. However, the highest growth rate in the visceral form was observed in 2016.

$6.96 \pm 1.34\%$ (25 cases) of total visceral leishmaniasis cases in the republic occurred in Lankaran economic region. The incidence was higher in 2004-2010 than in other years. No cases have been reported in the region since 2013. $64 \pm 9.60\%$ of cases (16 cases) were registered Jalilabad, $16 \pm 7.33\%$ (4 cases) were registered Yardimli, $8 \pm 5.42\%$ (2 cases) were registered in Masalli, $8 \pm 5.42\%$ (2 cases) were registered in Lankaran, $4 \pm 3.91\%$ (1 case) were registered in Lerik. $72 \pm 8.97\%$ (18 cases) of patients were women and $28 \pm 8.97\%$ (7 cases) were men. Of these, $36 \pm 9.6\%$ (9 cases) were among 0-1 age group, $48 \pm 9.99\%$ (12 cases) 1-4 age group, $8 \pm 5.42\%$ (2 cases) were among 5-13 age group, $8 \pm 5.42\%$ (2 cases) occurred between the 14-17 age groups.

In Lankaran economic region, cutaneous leishmaniasis was registered in sporadic cases in Lankaran city, Masalli and Jalilabad regions. 50% of those registered are women. $2.14 \pm 0.86\%$ of total morbidity (6 cases) occurred in this region, of which $16.67 \pm 15.21\%$ were among (1 case) 0-1 age group, $33.33 \pm 19.24\%$ (2 cases) were among 5-13 age group, $33.33 \pm 19.24\%$ (2 cases) were among 14-17 age group, $16.67 \pm 15.21\%$ (1 case) were among over 18 years old groups. $50 \pm 20.41\%$ of cases in Lankaran economic zone (3 cases) Jalilabad, $33.33 \pm 19.24\%$ (2 cases) in Masalli regions, $16.67 \pm 15.21\%$ (1 case) Lankaran registered in the city. An increase in the

dynamic rate of cutaneous leishmaniasis in this region was recorded in 2008, and in visceral leishmaniasis in 2016.

During 2000-2016, 3 cases of visceral leishmaniasis were registered in Nakhchivan economic-geographical region (2000, 2001, 2006). No cases have been reported since 2006.

No cases of cutaneous leishmaniasis were registered in Yukhari-Garabagh, Kalbajar-Lachin, Nakhchivan economic regions during 2000-2016.

As a result, it was found that visceral leishmaniasis is most prevalent in Ganja-Gazakh ($35.38 \pm 2.52\%$), Aran ($15.59 \pm 1.91\%$), Sheki-Zagatala economic regions ($18.66 \pm 2.05\%$). Cutaneous leishmaniasis was registered in Aran ($57.71 \pm 2.95\%$), Sheki Zagatala ($17.85 \pm 2.28\%$), Baku-Absheron ($12.14 \pm 1.94\%$) economic regions.

If we look at the dynamics of the number of visceral leishmaniasis and cutaneous leishmaniasis for 2000-2016, we can see that this figure has increased sharply.

Based on the data obtained from retrospective and operative studies, it was determined that cutaneous leishmaniasis was most common in the age group over 18 years, and visceral leishmaniasis was observed in the population group 1-4 years.

During the calculation of the dynamic rate of visceral leishmaniasis in the country during 2000-2016, a dynamic pace increasing was observed in 2004, 2005, 2007, 2008, 2010, 2012, 2016. In cutaneous leishmaniasis, a dynamic temp increasing was observed in other years, except for 2001, 2005, 2008, 2009, 2012.

According to the information obtained from the Republican HEC (Hygiene and Epidemiology Center) and other regional treatment facilities and our research, there were no significant changes in the foci and endemic areas where cutaneous leishmaniasis was detected. However, the same cannot be said for visceral leishmaniasis. Looking at the intensity of visceral leishmaniasis detection in the country from the early 1990s to 2016, it is clear that visceral leishmaniasis was previously detected in the southern part of the country, but in recent years it has shifted to the western and northern regions of the country.

In order to determine the actual source of visceral leishmaniasis among animals caused by *L. infantum*, which is considered a zoonotic disease in Azerbaijan, research was conducted in Baku-Absheron, Ganja-Gazakh, Aran economic-geographical regions. For this purpose, microscopic, bacteriological and ELISA-based leishmania canina rapid tests were used. Since the microscopic method is considered the most accurate in the diagnosis of leishmaniasis, the intensity of infections was mainly assessed by the results of this method. As a result of examinations, $4.23 \pm 1.46\%$ of infections were detected among the dogs and $0.99 \pm 0.69\%$ among rodents. Various microscopic, bacteriological, and serological examinations were performed at the sites of infection to detect cases of cutaneous leishmaniasis and visceral leishmaniasis among the population and to determine the cheapest and most sensitive and specific serological examination methods for seroepidemiological examination of visceral leishmaniasis. For this purpose, blood samples were taken from 815 people and bone marrow samples from 115 people at visceral leishmaniasis centers. When blood samples were taken, $6.99 \pm 0.88\%$ (57) were positive, $89.57 \pm 1.06\%$ (730) were negative, and $3.43 \pm 0.63\%$ were uncertain in the immunochromatographic anti-k39 rapid tests examination. During IFA examinations, $10.30 \pm 1.06\%$ (84) positive, $87.36 \pm 1.16\%$ (712) negative, $2.33 \pm 0.51\%$ (19) uncertain results were obtained. Of the blood samples taken, 43 were visceral leishmaniasis patients with amastigot. At the end of the general results, it was found that when comparing the methods, the sensitivity in the IFA method is 74.41%, specificity is 93.19%, in the immunochromatographic anti-k39 rapid tests the sensitivity is 83.72%, the specificity is 95.17%. It follows that immunochromatographic k39 rapid tests have a higher sensitivity and specificity than IFA tests. However, the disadvantage of these tests is the high uncertain results. That is, among the tests, the unusable samples are to some extent superior to others. Positive results were obtained in patients, and treated patients with immuno-chromatographic anti-rK39 tests. However, the sharpest positive results were obtained in current patients. After long-term treatment, the results were

somewhat different. In other words, in the tests, the formation of the confirmation line was delayed and was defined as a very weak red stripe. This suggests the use of immunochromographic anti-rK39 tests not only for epidemiological purposes, but also to assess the progress of the treatment process.

27.82±4.17% of positive results were obtained from bone marrow recipients. Only 57.39±4.61% (66 people) of the bone marrow recipients were examined by bacteriological method (culture in NNN nutrient medium), of which 93.75±2.97% were obtained promastigotes.

To study the epidemiological features of cutaneous leishmaniasis, research was conducted mainly in Goychay and Agdash regions of Aran economic region. For this purpose, the wound contents of 105 people were examined by microscopic method. 165 smears were made from the taken wound samples, amastigotes were found in 48 smears, which were smears obtained from the wound content of 19 (18.09 ± 3.75%) people. In addition, samples taken from the wound contents of 105 individuals were cultured in NNN nutrient medium and positive results were obtained in samples taken from 16 patients (15.23 ± 3.50%).

As a result of epidemiological studies, when determining the boundaries, time and space of foci of cutaneous leishmaniasis and visceral leishmaniasis, it was found that in some regions of Azerbaijan both forms of the disease are found with the same intensity. We identified this during research in Sheki, Goychay and Agdash districts. More precisely, mixed foci were observed in Bigir, Yeniarkh village of Goychay, Gurjuva villages of Agdash and Ashagi Goynuk villages of Sheki. Examination of animals in mixed centers did not reveal a positive result. During 2016, 4 visceral leishmaniasis and 5 cutaneous leishmaniasis were registered among the population living in Sheki region. Three cases of visceral leishmaniasis occurred in children aged 0-1 years, and one in children aged 1-4 years. When examining the demographic composition of patients by age and sex, it was found that visceral leishmaniasis is most common in children aged 1-2 years in these

areas, which are considered endemic for cutaneous leishmaniasis. In 2016, a hemagglutination test was performed on the examination materials of patients and it was assumed that visceral leishmaniasis could be caused by *L. tropica* in children aged 0-1 years: *L. tropica* may also play a role in the formation of the etiological structure of visceral leishmaniasis in children aged 0-1 years in Sheki and Goychay regions.

RESULTS.

1. Looking at the intensity of detection of visceral leishmaniasis in the country during 1990-2016, it was found that the disease has shifted from the southern zone of the country to the western and northern regions. During the calculation of the dynamic rate of visceral leishmaniasis in the country during 2000-2016, a dynamic increase was observed in 2004, 2005, 2007, 2008, 2010, 2012, 2016. In cutaneous leishmaniasis, a dynamic increase was observed in other years, except for 2001, 2005, 2008, 2009, 2012.

2. As a result of regional studies conducted in 2015-2016 on the basis of "Iceberg syndrome", the detection of patients increased by 2-3 times. It was found that cutaneous leishmaniasis is most common in the age group over 18 years of age, and visceral leishmaniasis in the age group 1-4 years. Visceral leishmaniasis is most prevalent in Ganja-Gazakh ($35.38 \pm 2.52\%$), Aran ($15.59 \pm 1.91\%$), Sheki-Zagatala economic regions ($18.66 \pm 2.05\%$), while cutaneous leishmaniasis is most prevalent. It was registered in Aran ($57.71 \pm 2.95\%$), Sheki-Zagatala ($17.85 \pm 2.28\%$), Baku-Absheron ($12.14 \pm 1.94\%$) economic regions.

3. *Phlebotomus kandelaki*, *Phlebotomus transcaucasicus*, *Phlebotomus tobbi*, *Ph.pappatasi*, *Ph.sergentin* are the main epidemiologically important sandfly in the transmission of leishmaniasis in the territory of the Republic of Azerbaijan. The sensitivity of sandflies to disinfectants was compared and it were found that sandfly is more sensitive to cypermethrin. It less toxic to humans and had a longer duration of action than other pyrethroids,

and the use of 25% cypermethrin in residential areas was considered more appropriate. It is more expedient to use 2%, 3%, 4% malatione solution in the disinsection of places outside the settlements, inaccessible to the population and other farm animals: after using this drug 100% lethality is achieved and the duration of action is lasted for 3-5 months.

4. As a result of examinations to identify the actual source of infection, $4.23 \pm 1.46\%$ of infections were detected among the dogs and $0.99 \pm 0.69\%$ among rodents.

5. It has been detected that, low-cost immunochromatographic anti-rk39 rapid test (price N10-10) with 83.72% sensitivity, 95.17% specificity is expedient and cost effective serological method for the seroepidemiological diagnosis of visceral leishmaniasis.

6. As a result of studying the etiological structure of visceral leishmaniasis in mixed foci, it was found that visceral leishmaniasis can be caused by *L. tropica* in children aged 0-1 years; *L. tropica* may also play a role in the formation of the etiological structure of visceral leishmaniasis in Sheki and Goychay regions.

PRACTICAL RECOMMENDATIONS.

1. Biological and geographical features of sandflies should be taken into account during the effective organization of disinsection measures against leishmaniasis.

2. The use of 25% cypermethrin in settlements is more effective in the control of leishmaniasis vectors.

3. The sources of visceral leishmaniasis in the territory of Azerbaijan is the rodents together with dogs. Thats why, deratization measures should be strengthened in accordance with seasonal dynamics.

4. In the seroepidemiological examination and diagnosis of visceral leishmaniasis, it is more appropriate to use the cheapest, immunochromatographic anti-rk39 tests, which do not require any laboratory conditions for use, and show high specificity and sensitivity.

5. Considering that *L. tropica* can also cause visceral leishmaniasis among children aged 0-1 years, it is more expedient to strengthen

anti-epidemic measures by the Republican GEM and regional GEMs in the foci of cutaneous leishmaniasis detected in the regions.

6. It is considered expedient to use the obtained information in the form of methodical recommendations in the curriculum of medical educational institutions and to apply it in the practical work of HECs of our republic.

List of published articles related to the dissertation

1. V.Ç.Cəlilov, V.N.Vəkilov, A.Z.Fərəməzov. Müasir dövrdə Azərbaycanda visseral leyşmanioz ocaqlarında hünülərin coğrafi-bioloji xüsusiyyətləri və epidemioloji əhəmiyyəti //“Azərbaycan təbabətinin müasir nailiyyətləri” Jurnalı, Bakı, 2017, №2, s126-130. ISSN2073-2651
2. Cəlilov V.Ç., Vahabov E.F., Dünyada və Azərbaycanda leyşmaniozlara görə müasir epidemioloji vəziyyət // «Sağlamlıq» jurnalı, Bakı 2017, №2, s. 110-115. ISBN-5-8035-0168-9
3. Cəlilov V.Ç. “Müasir dövrdə Azərbaycanda dəri leyşmaniozu ocaqlarında hünülərin coğrafi-bioloji xüsusiyyətləri və epidemioloji əhəmiyyəti”. “Sağlamlıq” jurnalı, 2017 №4; səh. 183-187. ISBN-5-8035-0168-9
4. Cəlilov V.Ç. “2000-2016-cı illər ərzində Abşeron iqtisadi-coğrafi rayonunda visseral leyşmaniozun epidemioloji xüsusiyyətləri”// “Azərbaycan təbabətinin müasir nailiyyətləri” Jurnalı, Bakı, 2017, №3, s.67-71. ISSN2073-2651
5. Vahabov E.F., Cəlilov V.Ç. “Gəncə-Qazax iqtisadi zonasında visseral leyşmaniozun epidemioloji vəziyyəti” //Ə.e.x., prof. R.Ə.Əsgərovun anadan olmasının 85 illik yubileyinə həsr olunmuş beynəlxalq elmi konfrans materiallarının toplusu Bakı 2018, səh 135.
6. V.Ch.Jalilov. “Epidemiological situation of visceral leishmaniasis in Azerbaijan Republic in modern time”. //Семейная медицина/ научно-практической журнал// Украина 2017 //с.107-110. ISSN2307-5112
7. V.Ç.Cəlilov. “Aran iqtisadi-coğrafi rayonunda leyşmaniozların epidemioloji monitorinqi”// “Azərbaycan təbabətinin müasir nailiyyətləri” Jurnalı, Bakı, 2018, №3, s.68-72. ISSN 2073-2651
8. Джалилов В.Ч. “Эпидемиологический мониторинг кожного лейшманиоза на территории Азербайджанской Республики в 2000-2016 гг”. // Журнал «Медицинские новости» // Белоруссия-2019. ISSN 2076-4812

9. I.Agayev, E.Vahabov, E.Moradi, A.Saghafipour, V.Jalilov “Epidemiological situation and spatial distribution of visceral leishmaniasis in the Republic of Azerbaijan”[Journal of Parasitic Diseases](#) volume 44, pages 639–645(2020). 16 july. 2020. N44 ISSN 0975-0703; ISSN 0971-7196
10. V.Ç.Cəlilov, V.N.Vəkilov “Leşmaniozların epidemioloji monitorinqi”. “Təbabətin aktual problemləri” elmi-praktik konfrans materialları, s. 238. Bakı 2017
11. V.Jalilov “Epidemiological and biostatistical features of the visceral and cutaneous leishmaniasis in Azerbaijan” RS Global International Scientific and Practical Conference. Warsaw, Poland, February. p.17-18 2020. ISBN 978-83-956628-3-6

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