Geoepidemiology of American Cutaneous Leishmaniasis (ACL) in the South of Rondônia, Brazilian Amazon

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Abstract— *American Cutaneous Leishmaniasis (ACL) is one of the parasites with specific characteristics in several regions of Brazil. In recent years, there have been variations in the increase in the number of cases of this disease in different regions of the country. In the state of Rondônia, ACL is considered one of the endemic diseases. Objective: This study described epidemiological aspects of ACL in a subspace of Rondônia, Western Amazon, in the period between 2012 and 2013. Method: This is a retrospective epidemiological study developed in 02 municipalities located in the south of Rondônia according to with model developed by Paraguassu-Chaves [3] comprising the municipalities of Vilhena and Chupinguaia. Results: The study revealed that 370 human cases of ACL were reported in the study period. The male gender predominated with (89.5%) of the total cases, the age range (20 to 39) years (36.6%) prevailed, low schooling (80%) had a maximum of complete elementary education (62.5%). The greatest number of cases came from the urban zone (66.9%), resulting from the adaptation of sandflies to the periurbanization of cities in the Amazon, as predicted by Paraguassu-Chaves [3]. Some of these variables presented significant differences when compared to production and distribution in the*

State of Rondônia. Prevalence of autochthonous cases was 81.7%. Regarding the clinical aspects, the cutaneous lesion (CL) predominated with 90.8% of the new cases. As expected, the cases confirmed by confirmation criteria indicate 89.5% clinical-laboratory confirmation in the studied subspace and 94% in the State of Rondônia. Of the cases confirmed by evolution of the case prevailed to cure with 77.5% and 12.5% ignored or recorded in the blank. The dropout still stands out negatively with 8.4%. Conclusion: The ACL presents a public health problem due to its high endemicity. It was identified some important epidemiological variables for the study in the Brazilian Amazon and that can condition and / or determine areas associated with possible risks of infection by the parasites.

Keywords— *American Cutaneous Leishmaniasis (ACL), Epidemiology, Subspecies, Rondônia.*

I.   INTRODUCTION

The distribution of the most incidental diseases in the epidemiological context of Rondônia is associated with the diverse socioeconomic and environmental processes that are decisive in the construction, configuration and reconfiguration of the geographic space, and they potentiate or amortize the determinants and determinants of the disease production process. Both malaria, tuberculosis, measles, leishmaniasis, leprosy, pertussis, and those related to sanitation, such as diarrheal diseases and infectious hepatitis, are currently reported to be common damage to underdeveloped regions [1]. The problem of our inquiry is American Cutaneous Leishmaniasis - ACL. How does this disease behave in the southern region of Rondônia, Western Amazon? What are its determinants and / or determinants? What is its endemicity?

From the foundations of tropical pathology, a set of diseases, many of them endemic in nature, whose presence is conditioned to the existence of etiological agents or "transmission mechanisms" ", Clearly related to certain bioclimatic conditions of the tropical environment, despite the practices of hygiene and modern medicine have overturned the old damages of the climatic fatality.

The geographical environment creates constant and necessary conditions for the incidence and spread of numerous diseases in the Amazon. Both the development of vectors and the multiplication of pathogenic organisms are linked to the geographical environment and especially to climatic conditions. Nonetheless, the development of social medicine, collective health, and even social ecology posits the broadening of the definition of pathogens to social components. Among the proposals for exchanges in current public health theory, they propose to recognize as central pathogens of analysis, inequities,

class hierarchy, racism, regional decay and social fragmentation [3,4,5,6,7].

American Cutaneous Leishmaniasis (ACL) is a pleomorphic parasitic skin and mucosal disease caused by protozoa of the genus *Leishmania*. Cutaneous disease is classically characterized by papules, which develop into ulcers with raised borders and granular bottoms, which may be single or multiple and are painless. They may also be manifested by warty, papular, localized or diffuse plaques [8]. This pathology is characterized by being primarily a zoonosis of wild animals such as marsupials and rodents, and with the urbanization of ACL, animals such as dogs, horses and domestic rodents are involved in the epidemiological chain as reservoir [9].

Infections caused by protozoa of the Order Kinetoplastida - trypanosoma cruzi, *Leishmania* chagasi and *Leishmania brasiliensis* are enzootic in the tropics, where there are abundant mammalian reservoirs, vectors and natural ecotopes where the chain links are observed. The degradation of this ecosystem by the anthropic action as deforestation can lead to the rupture of the trophic chain, propitiating the transfer of the enzootia to the human population [10].

The mode of infection by the parasites of the complexes "mexicana" and "brasiliensis" depends on the direct contact of the individuals with the forest environment, since their vectors have the biotopes and the activities located there.

Lainson and Shaw [11,12,13] attributed the high incidence of leishmaniasis in certain areas of the Amazon to large human contingents that penetrate into the forest, not only as a consequence of road openings but also because of the occupation of large empty spaces in the region. There is evidence that the groups of workers who cleared the forest for the construction of highways or carried out works of vegetal extractivism, were the most attacked [14,15]. It also states that no control of the disease can be proposed without the deep knowledge of the parasite and its epidemiology, since leishmaniasis is predominantly wild diseases, and the incidence has been verified in several regions of the world, especially in tropical forest areas. The Amazon is the largest tropical region and the area where the largest variety of *leishmanias* has been found.

According to Corrêa [16] referring to Fraiha (1976), the incidence of leishmaniasis in the Amazon is still not well known due to the difficulties in the differential diagnosis with other dermatoses and also because a small number of patients seek the doctor for treatment, either by ignorance or lack of resources. Thus, the disease presents a high prevalence, especially in rural areas, with nosological conditions that assume severe forms that lead to mutilations and serious defects, sometimes permanent.

According to Paraguassu-Chaves [3], the taxonomic revision of the New World leishmaniasis was carried out in the Amazon by the Evandro Chagas Institute of Belém - State of Pará. There are three biologically and biochemically different species of parasites present in the Amazon region : *L. braziliensis* or *Leishmania (viannia) braziliensis* (Viana, 1911); *L. braziliensis guyanensis* or *Leishmania (viannia) guyanensis* (Floch, 1954) and *L. mexicana amazonensis* or *Leishmania amazonensis* (Lainson and Shaw, 1973).

In the particular situation in Rondônia, American Cutaneous Leishmaniasis, considered enzootic among wild animals, increased the number of epidemic peaks in areas of primary forest subjected to human intervention in the 70s and 80s, and still in the current two remains high incidence. The rich phlebotomine and mammalian fauna have been found Lutzomyas, Psychodopygus and Brumptomyia. Of the 40 sandfly species cataloged in Rondônia, there is a predominance of P. davisi species, and P. geniculatus, L. umbratillis, L. whitmani, P.welcome, L. flaviscutellata, P. ayrozai, P. llanosmartinsi [3,4,5,6,7].

The objective of this study was to describe the epidemiological aspects of ACL in a subspace of Rondônia (subspace 08) for the years 2012 and 2013 and to identify the epidemiological profile of individuals diagnosed with ACL by characterizing the following variables: gender, age group, occupation, degree of schooling, economic activity and origin / origin, type of injury.

II. METHOD

It is a retrospective epidemiological study developed in 02 municipalities located in the south of Rondônia according to a model developed by Paraguassu-Chaves [3], comprising the municipalities of Vilhena and Chupinguaia.

For the analysis of the epidemiological profile in patients affected by the ACL, surveys of the records contained in the SINAN database (National System of Aggravation and Notification) were carried out with the State Health Secretariat for the period of 2012 and 2013.

The data contained in the forms of the National Health Foundation (FUNASA) and their respective analyzes were transcribed to a worksheet in MS Excel Office XP Program, where a descriptive statistic was used to characterize the sample in the variables studied, using the geometric mean, median , standard deviation and percentage.

The data without information were disregarded.

Later they were prepared through the program IPI-INFO 6.04 to carry out the statistical analysis. The associations of interest were verified through chi-square test and t-test, with 95% confidence interval and p value <= 0.050.

Epidemiological indicators were based on the Brazilian guidelines [4], where the incidence coefficient was calculated. To verify the incidence coefficient of cases, they were adapted to the standards recommended by the Ministry of Health [10,11] [17,18], which guides the calculation of the following topics: Number of confirmed new cases of ACL (code B55 .1 and B55.2 of ICD-10) per 100,000 inhabitants in the population living in a given geographical area in the year under consideration. In this study the calculation method was used for 10 thousand inhabitants.

The spatiality model proposed by Paraguassu-Chaves [3] identifies 11 subspaces in the state of Rondônia, among them subspace 08 with the following description: subspace where are located the municipalities of Vilhena and integrates to him the municipality of Chupinguaia. Both are considered municipalities in the southern region of the State of Rondônia. According to Paraguassu-Chaves [3], in this subspace, we observe one of the sources described as the increase of notifications for ACL has been associated with the predominance of pastures and need concrete studies that allow to discern the existence of a new geoepidemiological pattern of transmission.

III. RESULTS AND DISCUSSIONS

The data indicate that 370 new cases of ACL were reported in this subspace during the study period.

In this same period in the state of Rondônia were notified 2,346 new cases of ACL distributed in 52 municipalities or 11 subspacialities. The subspace 08 comprised by the municipalities Vilhena and Chupinguaia, located in the southern part of Rondônia, accounts for 15.8% of the ACL reported in the State.

Among the reported cases, 367 (89.5%) occurred in males and 43 (10.5%) in females (Table 1). The distribution of new cases was similar in each subspace with respect to gender, with no significant differences ($X2 = 3.0900$; $p = 0.0787$).

Table.1: Distribution of new cases of ACL, reported in the years 2012 and 2013 in subspace 08, according to gender. - Subspace 08   Rondônia

Gênre	F	%	F	%
Male	328	**88,65**	2077	88,5
Female	42	11,35	269	11,5
TOTAL	370	100,0	2346	100,0

Source: SINAN / MS, 2015.

In this same period in Rondônia, in a total of 2346 new cases, it predominated in the male population with 2,077 new cases, corresponding to 88.5% of the people affected by the ACL.

It was identified that the age of the individuals notified with ACL varied from less than 1 year of age to greater than 60 years. The new cases were more prevalent in the

age group of 20 to 39 years with 36.6% of the new cases. Among the new cases that arouse attention, there are the <15 years with 24.6% (table 2).

Table.2: Distribution of new cases of ACL, reported in the years 2012 and 2013 in subspace 08, according to the age group.

Age Group	F	%
1-14	87	24,6
15-19	27	7,7
20 a 39	129	36,6
40-59	70	19,8
60 ou mais	19	5,4
Ignorado	21	5,9
TOTAL	353	100

Fonte: SINAN/MS, 2015. * 17 casos foram desconsiderados por falta de informação.

The level of schooling was low, where it is verified that 80% had at most the complete elementary education, the others with levels of schooling (20%) between half incomplete / complete or did not inform their schooling. With regard to schooling, the distribution of categories was similar to that of the State of Rondônia (x2 = 8.8353 and p = 0.1830).

Regarding the considerations of color classification specified by the Ministry of Health of Brazil, the analyzes revealed that there was a higher prevalence in white with 62.5%. In the other color categories, they showed significant differences in relation to Rondônia.

Table.3: Characterization of people notified with new cases in the subspace, according to ethnicity/color. -

ETHNICITY	Subespace 08		Rondônia	
	F	%	F	%
White	231	62,5	849	36,2
Black	9	2,5	159	6,8
Yellow	0	0	17	0,7
Brown	78	21,0	1152	49,2
Indígenous	9	2,5	86	3,6
Ignored	43	11,5	83	3,5
TOTAL	370	100	2346	100

Source: SINAN / MS, 2015.

Differently from what is found in subspace 08, in the territory of the State of Rondônia, people who are affected by ethnic / brown ACL predominate with almost 50% of the new cases and 36.2% of the white population.

Regarding the area of residence, 66.9% of the individuals reported in the subspace reported residing in the urban area. In the distribution by place of residence the differences were significant in relation to the State of Rondônia (x2 = 21.6104; p = 0.0000).

Table.4: Place of residence and distribution of persons notified with new cases of ACL in subspace 08, in the years of 2012 and 2013.

PLACE OF RESIDENCE	F	%
Urban area	194	66,9
Countryside	63	21,8
Peri-urban	24	8,2
Uninformed	9	3,1
TOTAL	290	100,0

Source: SINAN, 2015. * 80 cases were disregarded for not including the data in the file.

Regarding the origin or origin, of the total number of individuals with ACL reported approximately 90% of the subjects are born or migrants considered to be of the municipalities studied.

Among the reported cases, it was verified that most of them, (81.7%) of autochthonous. The indigenous people resemble those of the State of Rondônia, 82.7%.

Table.5: Cases confirmed by Autochthonous in subspace 08 and in the State of Rondônia, in the years of 2012 and 2013.

AUTOCTHONOUS	Subespace 08		Rondônia	
	F	%	F	%
YES	294	81,7	1942	82,7
NO	47	13,0	316	13,5
Indeterminado	19	5,3	88	3,8
TOTAL	360	100,0	2346	100

Source: SINAN, 2015.

The reported individuals presented several activities being the most prevalent: several workers (17%), agricultural workers (13%), agricultural workers (6.0%), students (6%), drivers (4%) and stonemasons %). In general, among those who reported, approximately 75% are people who work directly in the urban area.

Regarding the clinical aspects observed, it was verified that in the clinical evaluations performed in which there was positivity with respect to some type of lesion that were 90.8% for cutaneous lesion, 9.2% for mucosal lesion. It is not different from that of the state of Rondônia, with 91.4% in cutaneous clinical form and 8.6% in mucosa.

Table.6: Cases confirmed by Clinical Form in the years of 2012 and 2013.

CLINIC FORM	Subespace 08		Rondônia	
	F	%	F	%
Cutaneous	336	90,8	2146	91,4
Mucosa	34	9,2	200	8,6
TOTAL	370	100	2346	100

Source: SINAN, 2015.

Of the cases confirmed by type of entry 97% in subspace 08 resembles the 95.3% of new cases confirmed in the State of Rondônia.

Table.7: Cases confirmed by Type of Entry in the years of 2012 and 2013.

	Subespace 08		Rondônia	
Imput Type	**F**	**%**	**F**	**%**
New Case	359	**97**	2292	**95,3**
Relapse	6	1,6	96	3,9
Ignored/White	5	1,4	21	0,8
TOTAL	**370**	**100**	**2409**	**100**

Source: SINAN, 2015.

As expected, the cases confirmed by confirmation criteria indicate 89.5% clinical-laboratory confirmation in subspace 08 and 94% in the State of Rondônia.

Table.8: Cases confirmed by Confirmation Criteria in the years 2012 and 2013.

	Subespace 08		Rondônia	
CONFIRMATION CRITERIA	**F**	**%**	**F**	**%**
Clínical-Laboratory	331	**89,5**	2204	**94,0**
Clínico-Epidemiological	39	10,5	142	6,0
TOTAL	**370**	100	2346	100

Source: SINAN, 2015.

Of the cases confirmed by evolution of the case prevailed to cure with 77.5% and 12.5% ignored or recorded in the blank. The dropout still stands out negatively with 8.4%. In this case there is a statistically significant difference between the evolution of new cases between subspace 08 and the State of Rondônia.

Table.9: Cases confirmed by Case Evolution in the years 2012 and 2013.

EVOLUTION OF THE CASE	**F**	**%**
Ignored/White	45	12,5
Cure	279	**77,5**
Abandonment	30	8,4
Death by ACL	0	0,0
Death by another cause	2	0,5
Transfer	4	1,1
Change of Address	0	0,0
TOTAL	360	100,0

Source: SINAN, 2015.

ACL is considered one of the public health problems in several regions of the world. In the state of Rondônia - Brazil, it represents one of the main endemic problems related to the health of the population. Recognizing the different aspects related to the disease can help characterize the different spaces of this region, contributing to the changes related to the well being of the population [16].

The data revealed that there were 370 new cases registered in subspace 08 corresponding to the municipalities of Vilhena and Chupinguaia located in the southern region of the State of Rondônia, representing 15.8% of the ACL reported in the State of Rondônia.

It was verified that there is a prevalence of the male gender representing 89.5% of the cases. It was also verified that between the subspace and the State of Rondônia there were no significant differences, being evidenced in the chi-square test ($x2 = 3.0900$; $p = 0.0787$).

As far as the age group was concerned, these ranged from 1 year old to 60 years old, prevailing among the 20 to 39 year olds with 36.9% of the new cases. Among the new cases that arouse attention are the <15 years with 24.6%. The distribution of new cases with respect to age did not show significant differences between the subspace and the State of Rondônia.

In order to corroborate or not with the findings in subspace 08 (South of Rondônia), similar studies were searched in specialized literature. As for example, the data obtained by Magalhães et al [19] in a study on the comparative clinical aspects of ACL in the Amazon Region and Central West Region, verified that there was a significant incidence of ACL in the 15-25 age group. Menezes, Aquino and Caldas [9] verified similar data (16 to 30 years). According to Brazil [17,20], this age pattern suggests that the occurrence is related to the activities developed by ACL patients, because they are in a period of productivity. These data, which can be observed by checking the prevalence period of the disease, the economic activities and the development aspects of the region [16].

Corrêa [16] it is still observed that, when the other age patterns are observed, it is verified that there was less frequency in the occurrence. An explanation is given by Veloso et al. [21], when they describe that ACL can reach individuals of any age, being more frequent from 20 to 40 years. Other researchers corroborating the findings are Vieira, Jacobina and Soares [22], who describe that the highest concentration of cases of ACL is in the most productive age group (15-60) of age and in the male gender. Still, according to the same authors, this factor is related to the occupational character of this endo-epidemic.

Although there was no difference between the subspace studied and the State of Rondônia regarding the distribution by gender and age, it is important to note that there are other factors that can provide the infection of these patients, as already mentioned by Passos et al. [23], which suggests the coexistence of two models of ACL transmission. The greater care of men and adults suggests autside the home transmission in an economically active population, a fact that may be related to the greater

number of cases in relation to the masculine gender detected in this study. Another observation is that data contained in the literature describe that in parallel to the anthropic actions that have been established since the late nineteenth and early twentieth century, large outbreaks of ACL have led to the rapid recognition of the occupational character of the parasitose [24].

According to the data obtained, the region presents greater agricultural activity than in other areas of the State. The prevalence of men, with productive age range and low level of schooling, is related to the social behavior of the residents of this region and to the profile of the patients studied in this study. Other studies also reveal similar data, Name et al., [25] observed the prevalence of the incidence of ACL in men, farmers, in the economically active age group. Guerra et al. [26], in studies in the Amazon region, reported that a significant number of ACL patients had activity that exposed them to the *Leishmania* vectors, such as agriculture and labor, and farms. Most were of the male gender and were between 20 and 29 years of age [16].

A relevant data to be considered is that, currently, there has been a change in the epidemiological pattern of leishmaniasis transmission in several South American countries, as an important vector domiciliation in countries such as Venezuela, Peru, Bolivia and Brazil [27].]. This could explain the high incidence of ACL in the urban area of the municipalities that make up the two subspaces. This hypothesis has already been raised by Paraguassu-Chaves [3] when it states the readjustment of sandflies in the peri-urban zone and urban area of the cities in the Amazon and especially in the municipal and district headquarters in Rondônia.

With regard to the low educational level, one of the factors that can contribute to this pattern is the fact that a large part of the population, mainly in the Legal Amazon region, where the data contained in the literature show a predominance of patients with low educational level , low income, and consequently the predominance of low-skilled occupations. This pattern is already evidenced by Oliveira-Neto et al., [28], Passos et al., [23]; Brazil [20] also reveals that ACL, as well as most of the infectious-parasitic diseases, mainly affect the most deprived populations that may be involved in the factors associated mainly with occupational and leisure activities, associated to the disorderly exploitation of forests and road building. Hydroelectric plants, settlement, extraction of wood, development of agricultural activities, among others, determine this process [16].

Regarding the care given to women, children and other non-agricultural occupations, this may be related to intra and/or araund home activities, as observed by Passos et al. [23], Oliveira-Neto et al. [28]. Data that can collaborate with this information are described by Costa et al. [29], who report the occurrence in children under 5 years of age, collaborating the hypothesis of intra and/or araund home transmission.

It is verified that there are other factors that must be considered in this study, such as the urbanization process, which is characterized by the growth of cities in an area where there is the focus of the disease or the vector. Information already observed in the studies carried out by Profeta da Luz et al., [30] in Minas Gerais, where an urbanization process of ACL was described in the metropolitan region of Belo Horizonte. In addition to this consideration, it is worth mentioning that in the study of Brazil [8] there is evidence that the areas analyzed in this study are in an ACL circuit in the State of Rondônia and the dynamics of projection of ongoing development of the State observed in the mapping by socio- of Rondônia.

As for ethnicity / color distribution, it was observed that there was a predominance of white color (62.2%), differently from that found in other subspecies that make up the State of Rondônia, which predominates in brown skin color. It is suggested in this study that one of the factors to be considered is related to the very characteristic of the distribution of color-related ethnic groups in Brazil, according to IBGE (2000) data, 53%, declare to be white and 39.1% brown. These two with predominance. This subspace is characterized by the greater concentration of people declared white, migrants from the southern region of the country. It may justify this frequency, since in the state of Rondônia the brown color predominates (49.2%) followed by the white color with 36.2%.

Name et al. [25], in an analysis of data from the University Hospital of Brasília – FD (Federal District), observed that 57% of the patients were brown, 27% were white and 13.2% were black, while the indigenous Orientals corresponded to 2% of cases. These data differ from the white and brown color observed in the studies and data of the Brazilian Institute of Geography and Statistics [3]. Thus, one of the factors that may be related is the population migratory process or the deficiency in the definitions of skin color observed by the population, since color registration is defined by the declarant's own concept, and may have influenced the this survey.

Regarding the occupation, the patients presented the most varied professions, and it can be observed that in relation to the places where they develop it, there was predominance in the urban environment with 66.9%, while in the rural area 21.8%. Although it has not been observed which factors may have influenced the data in this study, it can be suggested that they are related to the development of leisure activities and to the urbanization process of the ACL, the extractive activities among others already observed by Brazil [17, 20].

Researchers such as Lima et al. [31] contribute to the interpretation of this study when describing the distribution of coutaneous leishmaniasis by remote sensing images, in the State of Paraná, Brazil, observing a greater number of cases of leishmaniasis in male adults probably related to the rural work near forests as already mentioned by other researchers, and also emphasize the leisure activities (mainly the fishing) in the margins of rivers and streams with riparian forests that, although altered, maintains the enzootic cycle of *Leishmania*. This behavior may be occurring in the subspace studied, since it presents characteristics such as well distributed hydrography and leisure activity probably unrelated to the urban environment because these are small and expanding municipalities, suggesting the urbanization process of ACL, as mentioned by Passos et al. , [23] and Oliveira-Neto et al., [28].

WHO [32] points out that urbanization is correlated with increased global mobility. As a risk factor, it affects each of the eco-epidemiological entities, which causes leishmaniasis, three of which are shown in detail. Zoonotic Cutaneous Leishmania (ZCL), Anthropic Cutaneous Leishmania (ACL) and Visceral Zoonotic Leishmania (VZL) also describe the understanding of the integration between changes in the urban environment and sandflies as vectors are a prerequisite for the appropriate design to strategy of disease prevention and control.

Other data corroborating these observations are those described by SUCEN [33] in which there is a report that the ACL is in a geographic expansion phase, with changes in behavior in the last decades, with a double epidemiological profile expressed by the maintenance of cases originating from or near the old outbreaks, and by the appearance of epidemic outbreaks associated with the factors resulting from migratory population processes, as well as disorganized growth and urbanization in rural areas where there is the zoonotic cycle and environmental changes produced by the men.

Regarding the data related to the urbanization of the ACL, it is observed in the studies of Sampaio and Paula [34], that 11 cases of ACL, in patients residing in the Federal District (Brasília) and have not left their area for a time ranging from 6 to 6 months to two years before the onset of the disease and that six of the 11, resided in the satellite city of Planaltina. Thus suggesting that they are cases in which to house or periodicize results of the growth of cities and places of focus.

Wiieyaratne, Arsenault and Murphy (1994), commented that the greater occurrence of urban outbreaks of leishmaniasis, when compared to other parasitic diseases, can be explained by its ability to expand very rapidly when introduced into endemic areas [16]. This factor may have occurred in subspace 08, since there was a greater occurrence of cases and there is great agricultural expansion in one of the municipalities. It is suggested, therefore, that the urbanization process observed in the municipalities, new states and places of residence should be considered and that this factor may have occurred in both subspaces, but with different intensities.

Regarding the clinical aspects, there was positivity regarding some type of lesion. The positive results were cutaneous lesions 90.8% and 9.2% for the mucosal lesion, not different from that found in the aggregate of the municipalities of Rondônia, with 91.4% in the cutaneous form and 8.6% in the mucosa.

The Paraguassu-Chaves study [35] presented similar findings to that found in this study. In their study "Primary skin lesions are the main clinical forms of the disease, accumulating in the years of study, between 98% and 100% of the total. Mucosal (secondary) or cutaneous-mucosal lesions are rarely diagnosed. Between 5% and 10% of the total cases are allochthonous and come mainly from the neighboring country, Bolivia."

In the study period the cases confirmed by type of entry prevails with almost 100% in new cases. Paraguassu-Chaves [36, 37] found similar results in a study carried out between 2009 and 2011 and the same findings by Corrêa [9] in the same subspace.

The most unique and adopted confirmation criterion in the Amazon region is clinical and laboratorial, which confirms the confirmation rates of cases in this study of 89.5% and for the State of Rondônia the index of 94%. These findings confirm those found by Paraguassu-Chaves [36, 37]. The prevalence of the confirmation criterion is justified by the model of the program adopted by the public health policies of the Health Department of the State of Rondônia, which instrumented the service with attention directed to the clinical-laboratorial service.

Of the cases confirmed by evolution of the case prevailed to cure with (77.5%) which seems to be below the recommended average. What may have happened is the fact that in subspace 08 in 2012 and 2013, 12.5 cases were recorded as ignored. In any case, these data seem to be worrying and require a better response from the public health service and a more in-depth study to identify what actually occurred in that period in relation to the evolution of new cases of ACL in the South of Rondônia.

IV.   FINAL CONSIDERATIONS

During the study period, 370 human cases of ACL were reported in only two municipalities located in the south of Rondônia, corresponding to more than 15% of all new cases of ACL in the State of Rondônia.

The male gender prevailed, the age range (15 to 30), low schooling, and white-skinned people prevailed.

The greatest number of cases came from the urban zone, resulting from the adaptation of sandflies to the

periurbanization of cities in the Amazon, as predicted by Paraguassu-Chaves [3]. Regarding the clinical aspects, the cutaneous lesion (CL) predominated.

The ACL presents a public health problem in subspace 08 of the Rondônia spatiality due to its high endemicity.

It was identified some important epidemiological variables for the study in the Brazilian Amazon and that can condition and / or determine areas associated with possible risks of infection by the parasites.

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