FIRST SURVEY ON KNOWLEDGE, ATTITUDE AND PRACTICES ABOUT PARASITIC DISEASES AMONG THE POPULATION IN THE CENTER OF MOROCCO: THE CASE OF LEISHMANIASES

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ABSTRACT

Background

The leishmaniases are a group of diseases caused by protozoan parasites from more than 20 Leishmania species. These parasites are transmitted to humans by the bites of the infected female phlebotomine sandfly. It is still a public health problem in several countries, notably in Morocco, where this pathology is widespread and is prevalent in sporadic or endemic forms.

Methods

In order to determine the knowledge of the population in terms of leishmaniases, its vector and means of transmission of the disease, we carried out a survey during the year 2017 with the consulting population at the level of all 45 Health Centers (H/C). The descriptive results are presented as percentages and numbers. The chi-square test was used to test the association between the variables. Values of $p < 0.05$ were considered significant. The calculation of chi^2 (X^2) and the p-value are carried out using the software R.

Results

The grouping of responses shows a lack of knowledge on leishmaniases and phlebotominae by a large majority of the population (97% and 95%, respectively), whereas there is no correlation between the socio-economic level of the population and this lack of knowledge ($X^2 = 2.8$, $p > 0.05$), nor between the socio-economic level and the knowledge of the risk related to insects ($X^2 = 6.4$, $p > 0.05$).

Conclusion

These data show the extent of the perception problems with parasitic diseases, particularly leishmaniases and also the lack of awareness of the population against this scourge. Indeed, these data can be used to define measures to be taken to limit or even eradicate exposure, and subsequently risk.

Keywords: *leishmaniases , sandflies, knowledge, attitude, practices, population*

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INTRODUCTION

Health and sustainable development are intimately linked. Communities under the pressure of a barrage of endemic diseases face enormous obstacles to improve the quality of life. Leishmaniases are examples of parasitic zoonoses that place these affected communities at a significant risk of morbidity, debility and mortality.

They are parasitic diseases caused by parasites from the genus Leishmania (1,2), and are transmitted from vertebrate to vertebrate following the bite of female sandflies (Diptera: Psychodidae) (3,4). These are emerging diseases and closely related to the state of the environment (5). The leishmanian pathogenic complex (parasite, vector, reservoir), evolves in a geographical area defined by a set of bioclimatic parameters (6). There are three main forms of the disease: cutaneous leishmaniasis (CL), visceral leishmaniasis (VL), also known as kala-azar, and mucocutaneous leishmaniasis (MCL) (7, 8). They are endemic in 88 countries, including 72 developing countries. A total of 370 million people are at risk of the disease (9, 10). For the success of any prevention and/ or control strategy for any disease, the participation of the population at risk or affected is an important step in their active involvement in carrying out the activities of the program. Indeed, the understanding of the perception, attitudes and practices of the population towards a disease is a determining factor for the success of control programs.

In Morocco, despite the kingdom's efforts, leishmaniasis in its different forms is endemic in many regions and continues to pose a major public

health problem (11, 12). The number of cases reported in 2015 by the epidemiology department of the Moroccan Ministry of Public Health was 8718 cases of leishmaniases. Several researches (13, 14, 15) have been carried out in order to combat this epidemic. However, no national study has been conducted on the population's perception of leishmaniasis and its vector. In this context, this study aimed to assess the knowledge, attitudes and practices of the population at the level of the prefecture of Meknes in relation to leishmaniases and their vector.

MATERIALS AND METHODS

Study area

The prefecture of Meknes (Figure 1) is located in north-west Morocco in the region of Meknes-Fes, on the plateau of Saïs, 140 km from the administrative border Rabat and 60 km from the spiritual capital Fez.

It is a predominantly urban subdivision: 82.3% of the population lives in urban areas compared to 17.7% in rural areas. The population is estimated according to the general population and housing census of 2014, at 835,695 inhabitants (16).

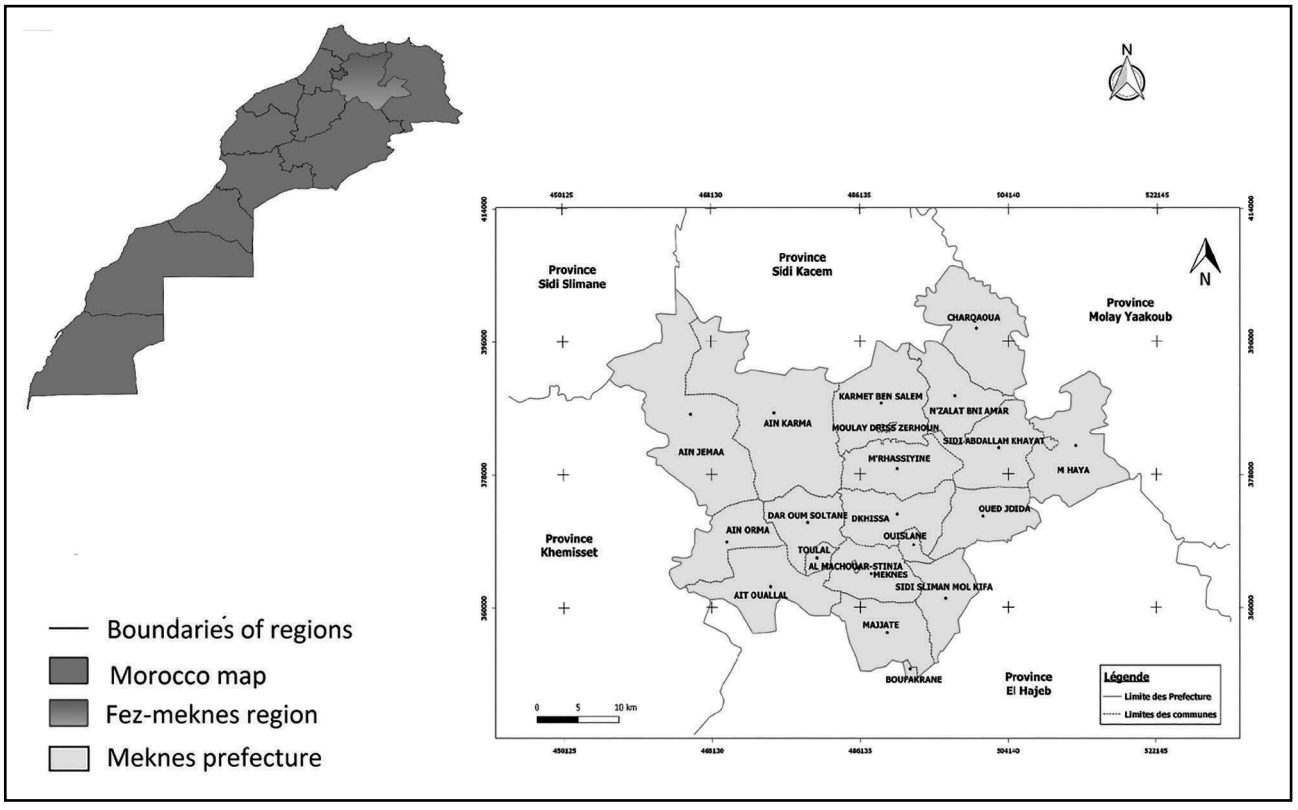

Figure 1. Geographic location of the study area (Meknes Prefecture)

Survey conduction

The purpose of the survey was to draw up a socioeconomic profile of the city of Meknes and the degree of perception of the health risk related to leishmaniases and their vector by the population of the prefecture of Meknes. A descriptive cross-sectional survey was conducted during the months of June and July 2017. The interview was carried out using a questionnaire. People were chosen at random to be interviewed individually.

A total of 383 interviews were conducted throughout the territory studied.

The conduction of this survey required some information concerning the studied phenomenon. Three factors essentially determine the sample size for a population survey:

- The estimated prevalence of the studied variable - leishmaniases in this case (p),
- the desired level of confidence (t),
- the acceptable margin of error (m).

For a survey design based on a random sample, we can calculate the required sample size by applying the following formula (17):

$$n = \frac{\mathbf{t}^2 \text{ x } \mathrm{p}(1-\mathrm{p})}{\mathbf{m}^2}$$

Explication:

- n = required sample size
- t = 95% confidence level (typical value of 1.96)
- p = estimated prevalence of leishmaniases (in case of lack of information, it is recommended to take p = 0.5)

- m = 5% margin of error (typical value of 0.05).

$$n = \frac{1{,}96^2 \times 0{,}5(1-0{,}5)}{0{,}05^2}$$

Statistical processing of results

The descriptive results are presented in the form of percentages and numbers. The Chi-square test was used to test the association between the variables. Values of $p < 0.05$ were considered significant. The calculation of chi^2 (X^2) and of the p-value is carried out using the R software.

RESULTS

The results of this study made it possible to identify the obst acles for the implementation of effective methods for combating and preventing this disease.

1. Socio-demographic characteristics of the studied population (Table 1)

A total of 383 individuals were interviewed, despite certain refusals. The majority of the consultants were women, 253 or 66%, while men represented 34%. represent More than half of the respondents, or a total of 248 Consultants had no profession (housewives, students and the unemployed).

The distribution of consultants according to monthly income showed that almost half of them or 49% had an income between 100 and 300 EUR, followed by 26% with an income between 300 and 800 EUR and 21% with an income below 100 EUR. Only 4% received more than 800 EUR per month.

Analysis of the education level of respondents showed that 32% had a secondary level against 30% illiterate, followed by 25% with a primary level only 7% -with a university level, and finally 6% - with a preschool level.

Table 1: Socio-demographic characteristics of respondents

Socio-demographic characteristics	**Number**	**Percentage**
Sex of the respondents		
Female	253	66%
Male	130	34%
Profession of the respondents		
Without	267	70%
Daily employment	60	16%
Official employment	24	6%
Retirement	19	5%
Other	13	3%
Monthly income of the family		
<1000 DH*	79	21%
1000-3000	190	49%
3000-8000	100	26%
> 8000	14	4%
Educational level of the respondents		
Without	115	30%
Preschool	22	6%
Primary	95	25%
Secondary	122	32%
University	29	7%

** DH, Morrocan dirham = 0.092 Euro*

2. Knowledge of leishmaniases and their vector

Almost all of the participants ignored leishmaniases (97%), while 3% of them had an idea about the disease. Only 10 from the surveyed who knew about leishmaniases confirmed that the disease was transmitted by an insect **(Table 2)**.

Statistical analysis showed that there was no statistically significant relationship between the knowledge of leishmaniases and the socio-economic level of the studied population ($X^2 = 2.8$, $p > 0.05$). Similarly, 19 respondents or 5%, have confirmed in the questionnaire that they knew the sandflies, against 95% who did not. Statistical analysis showed no statistically significant relationship between the knowledge of sandflies and the socio-economic level of the population ($X^2 = 6.4$, $p > 0.05$).

3. Participants' practices and attitudes of related to prevention of leishmaniases

Concerning the probability of an insect to transmit the disease, 358 respondents (i.e. 93%), confirmed the transmission by insects against only 7% who believed the opposite.

The answers concerning the use of some means of insect control showed that the majority of respondents (79%) used such a means to fight against all types of insects while 21% of respondents use no means. Regarding the type of control used, 68% of respondents confirmed using insecticides against 17% who used curtains, are about 11% Basil pest control users , and only 4% who used mosquito nets.

Table 2. Knowledge, attitude and practices related to leishmaniases and their vector

	Number	Percentage
Knowledge of leishmaniases		
Yes	10	3%
No	373	97%
Knowledge of sandflies		
Yes	115	5%
No	22	95%
Probability of disease transmission by insects		
Yes	358	93%
N	25	7%
Use ofsome means against insects		
Yes	303	79%
No	80	21%
Type of Means used		
Secticide	205	68%
Curtains	51	17%
Biological : basil	34	11%
Mosquito nets	13	4%

DISCUSSION

Understanding more about a disease, leishmaniases in particular, means going beyond its clinical and epidemiological characteristics and taking into account the viewpoints of those directly involved in the prevention and control of this epidemic, thus making these actions more effective.

The present study highlighted a number of problems concerning the health risk associated with leishmaniasis. For a young and mostly female population, the participation rate was very satisfactory. This could be explained by the fact that the target population included individuals with health problems, and the collaboration of health professionals certainly contributed to the success of the interviews.

The results of our study showed that most of the respondents had no idea about leishmaniasis and its vector (97%, and 95% respectively). On the other hand, they were aware of the health risks posed by insects transmitting diseases. These results were very poor as compared to similar studies carried out in Ethiopia, where (87.4%) had heard of leishmaniases and 89.4% of them were well informed (18).

Ten participants who said they knew about leishmaniases also said that the causative agent of the disease was transmitted by the bite of a sandfly. This result is similar to the one found in Sudan (19) where only 6% indicated that the disease was transmitted by the bite of sandflies. However, it is very low compared to the studies conducted in Saudi Arabia where 37.4% of participants could identify sandflies as the vector of leishmaniases (20). Statistical processing of the results showed that there was no correlation between the socio-economic level of respondents and the knowledge of leishmaniasis and its vector ($p > 0.05$) neither between the socio-economic level and the perception of the health risk related insects. Yet, poor housing, and malnutrition are among the risk factors implicated in the prevalence of leishmaniases (21, 22).

The ignorance of leishmaniases and sandfly population as their vector insect could be explained, on the one hand, by the lack of information from the part of the health personnel, and on the other hand, by the small size and the silent flight of vectors, making them difficult to identify. Thus even in endemic areas, the majority of the population may be largely unaware of the presence of sandflies (Diptera: Psychodidade) and their role in the epidemiology of the disease (23).

The adaptation of pathogenic vectors to urban areas and domestic environments (24, 25, 26),

requires that decision makers, organizations and health professionals implement significant actions in collaboration with the population. It is important that both citizens and health professionals take charge of the cycle of this disease so that, together, they could fight against this pathology.

Indeed, awareness programs must be put in place in order to fight against leishmaniases despite the fact that this epidemic is difficult to combat (27). This requires training community health workers in using simplified definitions of the different types of leishmaniasis. Moreover, several studies have recommended strengthening community awareness of leishmaniases and its control through health education (28) while taking into account the perception of the population, its beliefs and altitudes (29) . Several authors (30, 31) have defended the idea that the local population should be involved in the collective resolution of the problems and not only included as the scope of concern, or the source of data or the target of efforts.

These actions are also recommended by WHO experts in the fight against leishmaniases (32), in a technical report emphasizing the role of social mobilization in changing the behavior of the population.

It is also important to note that the use of mosquito nets and curtains as a means to control leishmaniases was low (4%, and 16% respectively). Thees results were much lower than those proved by a study carried out in Nepalwhere 58% used mosquito nets (33). Studies in Iran and Venezuela have shown that the regular use of insecticide-treated mosquito nets and curtains provides some personal protection against the bites of sandflies and the transmission of leishmaniases (34, 35). However, the use of insecticides is more frequent in the majority of the surveys, which explains the low number of cases recorded at the prefecture level (36), and at the same time proving the effectiveness of insecticides in the fight against the disease. These results are consistent with Rioux's research; who in a mission report on the outbreaks of cutaneous leishmaniases observed in the south of Morocco recommends the application of insecticides to fight against this epidemic and also confirms the results of Bettayeba et al., in 2016 (37), who concluded that leishmaniases must be prevented by vector control.

CONCLUSION

In the light of our results, we note that a misunderstanding of leishmaniases and their vector existed among the majority of consultants regardless of their socio-economic level while most of them (93% of consultants) were aware of the risk related to insects, and 79% of the latter used different means to combat these insects.

Indeed, efforts to fight against leishmaniasis are still insufficient, hence the need to set up a preventive strategy to fight against this pathology. Information campaigns improving the awareness of the population could be used to limit or even eradicate the exposure, and subsequently the risk of infection.

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