



INFECTIOUS DISEASE

Assessment of the knowledge, attitude, and practice related to visceral leishmaniasis among residents of Al-Suwaira city, Wasit Governorate, Middle East of Iraq

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Keywords

Practice • Attitude • Knowledge • Visceral leishmaniasis • Iraq

Summary

Introduction. It is important to assess the knowledge, attitudes, and practice (KAP) related to visceral leishmaniasis (VL) to implement an effective control program. Hence, this study aimed to highlight KAP among residents of Al-Suwaira city in Wasit Governorate, Middle East of Iraq.

Methods. During March to May 2021, a cross-sectional study was done on 121 randomly selected residents. A normal self-administered questionnaire was used to measure KAP. Descriptive analysis was used to present the results.

Results. Overall, participants indicated average knowledge towards VL. However, the incubation period of VL (23.9%), the symptoms of VL (57.9%), and the diseases' transmission ways (54.5%) were recognized as knowledge gaps. Participants had a positive attitude towards VL, as the majority of them (more than

70.0%) agreed that VL causes health problems in local populations and local communities should be actively involved in the fight against VL. Also, the majority of participants agreed that VL is a treatable disease. Regarding the practice towards VL, 110 (90.9%) participants had taken preventive measures against sand fly bites. The majority of respondents (44.6%) chose cleanliness as a preventive measure. The main sources of information that participants used to learn about the disease were the Internet (57.0%) and television (19.8%).

Conclusion. Overall, participants had good knowledge, positive attitudes, and good practice when it came to VL prevention. However, there were also some gaps. Hence, it is recommended that knowledge-based strategies be strengthened and implemented consistently to raise awareness among residents in the region.

Introduction

Visceral leishmaniasis (VL), often known as kala-azar (Hindi for black fever), is the most severe form of leishmaniasis caused by protozoan parasites of the genus *Leishmania* [1, 2]. Fever, weakness, weight loss, lymphadenopathy, pancytopenia, hepatosplenomegaly, and death are the symptoms and consequences of this chronic systemic disease [1, 3]. In the Old World, the etiologic agents are *Leishmania donovani* and *Leishmania infantum*; and in the New World, *Leishmania chagasi* is the contributing agent [1]. Transmission of the Old World and New World species occurs through members of the genus *Phlebotomus* and *Lutzomyia* sand flies, respectively. The parasite penetrates macrophages, where it replicates and causes disease, and is known to infect humans, wild and domestic animals [1, 2, 3].

Currently, the number of annual VL cases has decreased significantly (less than 100,000), compared with previous estimates of 400,000 cases [1]. Currently, leishmaniasis is endemic in the Mediterranean region, Africa, Americas, Asia and is found in 89 countries [4]. According to a report by World Health Organization (WHO), Sudan, Brazil, Nepal, Bangladesh, and India

accounted for 90.0% of all VL cases until 2010 [4]. VL is frequently found in distant places with few or no healthcare facilities, inadequate patient assessment and identification tools, inadequate personal protection, and most importantly, few or no skilled personnel [3, 5].

Both forms of cutaneous and visceral leishmaniasis occur in Iraq, and it has been classified as a high burden country by the WHO [6]. Iraq is one of the Middle Eastern countries with a higher incidence of VL in the city of Al-Suwaira in Wasit Governorate, which is located in the endemic area of Iraq between Baghdad and Misan. Most cases occur in rural areas where hygienic measurement and educational programs are lacking. The most important prerequisite for the success of any disease prevention and control program is community engagement. The cooperation of the affected population is necessary for the implementation and use of the program activities. Community knowledge, attitudes, and practices (KAP) related to the disease need to be assessed in order to implement successful prevention and control programs [3]. Also, the KAP study provides an opportunity to explore possible misconceptions about the disease in the community that may influence disease control and prevention [3].

To the best of our knowledge, there have been few studies evaluating KAP in the context of the VL cases in the Iraqi population. Hence, this study aimed to assess the KAP of residents in relation to VL to develop disease control programs that would contribute to the reduction of disease cases in Iraq, particularly among residents of Al-Suwaira city in Wasit Governorate.

Methods

ETHICAL CONSIDERATION

This study was approved by the Ethics Committee of the Middle Technical University, Baghdad, Iraq (January, 01 2021) in accordance with the Helsinki Declaration of 1975. Written informed consent was obtained from all participants.

STUDY AREA AND PARTICIPANTS SAMPLING

From March to May 2021, a descriptive cross-sectional survey was conducted among the population of Al-Suwaira city. Al-Suwaira is located in eastern Iraq at 32°56'25"N 044°38'04"E in the Wasit Governorate about 35 km south of Baghdad, the capital of Iraq. The residence registration number was used as the sampling frame for selecting individuals using a simple random sampling method.

INCLUSION AND EXCLUSION CRITERIA

Individuals 18 years of age and older from the city of Al-Suwaira in Wasit Governorate who had lived there for at least one year or longer participated in this study. Individuals under 18 years of age and those who had lived in the area for less than one year, as well as those who were unable to answer the questionnaire, were excluded from the study.

DATA COLLECTION

Data were collected using a self-administered questionnaire that was sent to the relevant participants for their responses. The questionnaire had been previously reviewed. After a thorough assessment of content validity, the first draft was forwarded to three experts for feedback on the relevance, simplicity, and importance of the content. The questionnaire was divided into five parts: the first part addressed participants' demographic data such as gender, age, occupation, qualification, marital status, and place of residence; the second part contained 12 questions assessing participants' knowledge of VL including causes, symptoms, transmission, incubation time, and disease prevention; the third part included seven statements assessing attitudes towards VL prevention and treatment; the fourth part addressed four questions assessing the participants' practices related to VL prevention and control; and the fifth part captured respondents' sources of information about VL. Demographic data were expressed in frequencies and

percentages using descriptive analysis. The response options for the knowledge questions were yes, no, and don't know. Participants' responses to the attitudes questions were scored with three agreement points : agree, disagree, and don't know. Response options for the practice questions were recorded as yes and no. Finally, the percentage of each category was calculated.

DATA ANALYSIS

Statistical Package for the Social Sciences (SPSS) version 20.0 (IBM Corporation, Armonk, NY, USA) was used to analysis of the responses of the participants.

Results

DEMOGRAPHIC INFORMATION OF THE PARTICIPANTS

A total of 121 individuals took the time to complete the survey. The demographic characteristics of the participants were shown in Table I. The majority of participants were under 30 years old (n = 77, 63.6%), and female participation was higher (n = 62, 51.2%) than male participation (n = 59, 48.8%). In terms of education, the majority of participants (n = 51, 42.1%) had a bachelor's degree, while only 5 (4.1%) individuals were unable to read and write. However,

Tab. I. Demographic information of the participants.

Demographic information		Number	Percent
Age Groups	< 30	77	63.6
	(30-40)	25	20.7
	(41-50)	14	11.6
	> 50	5	4.1
	Total	121	100.0
Gender	Male	59	48.8
	Female	62	51.2
	Total	121	100.0
Qualifications	Unable to read and write	5	4.1
	Primary school	21	17.4
	Secondary school	44	36.4
	Bachelor's	51	42.1
	Total	121	100.0
Occupation Status	Farmer	9	7.4
	Government employee	37	30.6
	Student	47	38.4
	House wife	21	17.4
	Others	7	5.8
	Total	121	100.0
Marital Status	Married	51	42.1
	Unmarried	70	57.9
	Total	121	100.0
Residence	Rural	23	19.0
	Urban	98	81.0
	Total	121	100

Tabl. II. Knowledge of contributors towards visceral leishmaniasis (VL) in Al-Suwaira city, Wasit Governorate, Middle East of Iraq.

Statements	Yes (%)	No (%)	I do not know (%)
VL is a parasitic disease.	65 (53.7)	10 (8.3)	46 (30.0)
VL is a very serious disease.	40 (33.1)	29 (23.9)	52 (42.9)
Incubation period of VL is 2 weeks-several years.	29 (23.9)	27 (22.3)	65 (53.7)
In a number of cases symptoms appear during 2-6 months.	40 (33.1)	30 (24.8)	51 (42.1)
Traveling to a VL endemic area is a risk factor for the disease.	80 (66.1)	10 (8.3)	31 (25.6)
VL is spread by sand fly.	55 (45.5)	14 (11.6)	52 (42.9)
VL is spread through malaria mosquitoes.	40 (33.1)	41 (33.9)	40 (33.1)
VL is spread by the carriers' worms.	50 (41.3)	40 (33.1)	31 (25.6)
Symptoms of the disease are high fever, loss of weight, hepatosplenomegaly, abdominal swelling, and muscle fatigue.	51 (42.1)	40 (33.1)	30 (24.8)
VL can affect all ages.	75 (61.9)	6 (4.9)	40 (33.1)
It is highly recommended to take preventive measures against this disease.	99 (81.8)	5 (4.1)	17 (14.0)
VL is a life-threatening disease in the absence of treatment.	62 (51.2)	16 (13.2)	43 (35.5)

when occupational status is taken into account, students (n = 47, 38.8%) were the most common respondents in this survey. The number of married participants (n = 51, 42.1%) was lower than single respondents (n = 70, 57.9%). The number of rural participants (n = 23, 19.0%) was also lower than urban participants (n = 98, 81.0%).

KNOWLEDGE OF THE PARTICIPANTS TOWARDS VL

In total, more than 50.0% of the participants selected "yes" response for 5 of the 12 available questions, indicating that participants had an average knowledge of VL (Tab. II). In the knowledge part, 53.7% (n = 65) of participants knew that VL is a parasitic disease. Also, 66.1% (n = 80) of participants knew that travel to a VL endemic area was a risk factor for the disease. The role of prophylactic measures to prevent VL was well-understood by 81.8% (n = 99) of participants. Almost half of the participants (n = 62, 51.2%) knew the importance of treating of the VL patients. However, participants were least likely to know about the incubation period of VL (n = 29, 23.9%). Moreover, the majority of participants (n = 50, 41.3%) incorrectly answered that VL is spread by the worms of carriers.

ATTITUDE OF PARTICIPANTS TOWARDS VL

Overall, the vast majority of participants had a positive attitudes toward VL (Tab. III). The majority of respondents (n = 76, 62.8%) agreed that VL causes health problems in the local population. The majority of participants (n = 110, 90.9%) agreed that VL is a treatable disease. The majority of them (n = 87, 71.9%) also agreed that local communities should be actively involved in the fight against VL. Similarly, the majority of participants agreed that people infected with VL should be treated (n = 110, 90.9 %). A high percentage of participants (n = 107, 88.4%) felt that the disease should be completely cured. However, 20.7% (n = 25) of participants felt that they were unaware of the severity of the disease. Contrary, 40.5% (n = 49) of the participants answered that VL is not a serious problem in our area. Furthermore, 29.8 % (n = 36) of participants expressed no attitude towards the possibility of controlling the VL disease through community involvement in their area.

PRACTICE OF THE PARTICIPANTS TOWARDS VL

Regarding practice towards VL, 110 (90.9%) participants had used preventive measures against sand fly bites as follows: bed nets (28.1%), dichlorodiphenyl-trichloroethane (DDT) (3.3%), isolation

Tab. III. Attitudes of participants towards visceral leishmaniasis (VL) in Al-Suwaira city, Wasit Governorate, Middle East of Iraq.

Statements	Participant's responses N (%)		
	Agree	Disagree	I don't know
VL is a health problem in the local communities.	76 (62.8)	11 (9.1)	34 (28.1)
The problem of VL is severe in your area.	21 (17.4)	49 (40.5)	51 (42.1)
Local communities should be actively involved in the fight against the VL.	87 (71.9)	6 (4.9)	28 (23.1)
Treatability of the disease.	110 (90.9)	2 (1.7)	9 (7.4)
Complete cure of the VL is possible.	107 (88.4)	5 (4.1)	9 (7.4)
I am exposed to the seriousness of the VL disease.	61 (50.4)	25 (20.7)	35 (28.9)
It is possible to control the VL disease through community participation.	78 (64.5)	7 (5.8)	36 (29.8)

Tab. IV. Practice of participants towards visceral leishmaniasis (VL) in Al-Suwaira city, Wasit Governorate, Middle East of Iraq.

Practices		Number	Percent
Prevention of sand fly	Bed net	34	28.1
	Dichloro-diphenyl-trichloroethane (DDT)	4	3.3
	Cleanliness of living environment	54	44.6
	Isolation of patients	18	14.9
	Not use prevention methods	11	9.1
	Total	121	100.0
Use of bed net	Yes	57	47.1
	No	64	52.9
	Total	121	100.0
Sleeping outdoor	Yes	40	33.1
	No	81	66.9
	Total	121	100.0
Work time preference when temperature is high	Day time	46	38.0
	Night time	35	28.9
	Both	40	33.1
	Total	121	100.0

of patients (14.9%), and use of cleanliness of living environment (44.6%). The practice of the participants towards VL is shown in Table IV. In total, 11 (9.1%) participants did not use any measure to avoid VL. About half of participants (n = 54, 44.6%) chose cleanliness as a disease-prevention technique. Also, 46 (30.0%) participants favored daytime working when the weather was hot.

INFORMATION SOURCES OF RESPONDENTS TOWARDS VL

Participants learned about VL primarily through the internet (n = 69, 57.0%), television (n = 24, 19.8%), and university (n = 22, 18.1%). Also, other sources such as radio, books, and newspapers account for 4.9% (n = 6) of the total.

Discussion

The prevalence of visceral leishmaniasis is unclear in certain parts of Iraq. This study is unique in that it identified an area for which there is little information. The findings of this study could have major implications for the development of future VL education and data distribution systems aimed at improving people’s knowledge and attitudes about VL control and prevention to improve public health in Iraq.

The results of the current study revealed that more than 50.0% of participants had good knowledge of some VL-related items as follows: VL is a parasitic disease (53.7%), travel to a VL endemic area is a risk factor (66.1%), VL can affect all age groups (61.9%), it is necessary to take preventive measures against VL (81.8%), and VL is a life-threatening disease if not treated (51.2%). However, almost half of the participants were unaware of other aspects of the disease. This highlights the need to improve knowledge in this

area through health education. The result of our study revealed that the majority of contributors (51.2%) knew that untreated VL is life-threatening, and 45.5% of them knew that VL is transmitted by sand flies. These findings were higher than a previous study from India, which indicated participants’ low knowledge of VL [7]. Also, in a previous report from Brazil [8], 61.2% of participants were unaware of the mode of transmission of the VL that was lower than the current study. This could be due to the different study population, as the majority of participants in this study had a secondary school degree or higher, and thus were better informed about the VL disease. However, our results were lower than a previous report from Ethiopia [9], in which 68.1% of participants knew that sand fly was the main route of transmission, and 96.7% of them knew that untreated VL leads to irreversible damages. Also, in a previous study from India [10], 98% of respondents reported that VL can be fatal if untreated, which was higher than the current research. In this study, 42.1% of participants knew about the symptoms of VL. This was higher than a previous report from Brazil [8], in which 83.5% of respondents did not know about VL symptoms. However, in a study from Ethiopia [11], 87.5% of participants knew the VL symptoms, which was higher than our result. Early detection and treatment of VL are dependent on recognizing clinical symptoms. The gap across studies could be due to a lack of health education and awareness in the community, as well as the socioeconomic status of different communities. The recurrence and re-emergence of the disease in the cities of Wasit province allowed the community to have more knowledge and education about the disease and its transmission to people, which is most likely the reason for these differences. This study revealed that more than two-thirds of contributors (81.8%) strongly advised taking preventive measures against VL, while only 4.1% of respondents stated the disease could not be prevented.

These findings were consistent with prior findings from Ethiopia [9, 11] and Iraq [12]. Participants were well-informed that the disease was preventable. This could be due to people's awareness of the preventability of other parasitic diseases (which are largely vector-borne diseases), leading them to believe that VL is also preventable.

In this study, the vast majority of contributors had a positive attitudes toward VL, which was in line with previous studies from India [7] and Ethiopia [9, 11]. The results showed that 62.8% of the contributors agreed that VL was a health problem in local communities. In a previous study by Alemu et al. [9] from Ethiopia, 53.1% of the contributors thought that VL was a health problem in local communities, which was lower than the current research. In total, 71.9% of respondents said that local communities should be actively involved in the fight against VL, while 4.9% did not. This was in line with previous findings that about 80% of participants thought that communities should be actively involved in the fight against kala-azar, whereas 7.6% did not [9]. Likewise, the majority of respondents (90.9%) knew that VL is a treatable disease. This finding was consistent with the Ethiopian findings [9, 11], where more than 85.0% of the respondents knew that the disease was treatable. In this study, participants had a high attitude towards complete cure of VL. A large number of participants (88.4%) believed that the disease can be entirely treated, which was consistent with previous findings from Ethiopia (86.4%) [9] and India (80.7%) [10]. The differences in people's attitudes toward complete cure of the disease could be due to a number of factors, including community awareness and people's tradition of interviewing patients to learn more about VL [9]. This study also examined participants' attitudes toward community involvement in controlling VL. The results were positive, with 64.5% of participants believing that VL can be controlled through community involvement. These data were consistent with the results from Ethiopia [9, 11] which showed that more than 70.0% of the respondents believed in the control of VL through community involvement. However, our results were inconsistent with a prior report by Govil et al. [10] from India where only 24.0% of respondents believed that community participation can be effective in controlling kala-azar.

Regarding the practice of prevention and control measures implemented in the study area, 110 (90.9%) residents reported that they took the following preventive measures against sand fly bites: bed nets (28.1%), dichloro-diphenyl-trichloroethane (DDT) (3.3%), isolation of patients (14.9%), and cleanliness of the living environment (44.6%). While 9.1% of the contributors did not use any preventive measures against sand fly bites. Bed nets were used by almost half of the contributors (47.1%). A total of 40 (33.1%) respondents reported sleeping outdoors, especially during high temperatures. These findings were consistent with previous findings from India [7] and Ethiopia [9], where the majority of residents used preventive measures against sand flies. However, in our region, a lower percentage of residents

used bed nets compared to the previous studies from India (97.9%) [7] and Ethiopia (93.7%) [9]. In contrast to the current study, a previous report by Gelaye et al. [13] from Ethiopia showed that more than half (59.5%) of the participants did not implement any preventive measures towards VL. Likewise, JS et al. [14] from India found that poor practices towards VL were prevalent among HIV patients, as 66% of them did not use bed nets. Sandflies can expand their geographic range due to changes in environmental and climatic conditions, which increase the risk of transmission of VL [14]. To reduce human-vector contact, it is important to educate people about the peak seasons, biting times, and breeding habitats of the sand flies [14].

In this study, 28.9% of the contributors preferred to work at night when temperatures were low, but even when temperatures were high, 38.0% of residents preferred to work during the day. This could be due to the lack of electricity, the socioeconomic status of the population, or people's habit of working throughout the day [9].

Our results revealed that donors mainly obtained information about VL from the Internet (n = 69, 57.0%), television (n = 24, 19.8%), and the university (n = 22, 18.1%). Other sources such as radio, books, and newspapers accounted for 4.9% (n = 6) of the total. Contributors reported using a variety of websites to learn more about VL. With the development of communication tools, the Internet has generally become the most common means of obtaining information about diseases. In a previous report from Ethiopia [3], friends (80.8%) and pamphlets (34.1%) were the most commonly used sources of information.

It is crucial to note that this study had some limitations as it was conducted in one location in Wasit Governorate and the results may not be generalizable to other areas. Therefore, it is helpful to study a large sample in different locations to find out what is going on. Despite the limitations, our findings have important implications for VL prevention and future studies.

Conclusion

Overall, participants had good knowledge, positive attitudes, and good practice when it came to VL prevention. However, diseases transmission, signs and symptoms, and incubation period of VL were still not well understood. Hence, it is recommended that knowledge-based strategies be strengthened and consistently implemented to raise awareness of the modes of transmission, symptoms, and incubation period of VL. This will enable the community to effectively participate in the prevention and control of the disease. The findings of this study could have far-reaching implications for future VL education and information activities targeting people in rural and urban areas of Iraq to improve their knowledge and attitudes towards VL. To close the gap in knowledge implementation, further research is needed in areas such as continuous communication of behavior change and activities related to social use.

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Conflicts of interest

The authors declare no conflict of interest.

Authors' contributions

All authors contributed to the study conception and design. M.H.G.K., I.D.S., and S.S.A. participated in the design of the study. I.D.S. and A.M.T. performed data collection, wrote the manuscript, and helped with statistical analysis. A.M.T. and S.S.A. edited the manuscript. All authors read and approved the final manuscript.

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