

VISCERAL LEISHMANIASIS IN NON-ENDEMIC DISTRICTS OF BANGLADESH: KNOWLEDGE GAP, ATTITUDE AND PRACTICE OF INHABITANTS AND PROFESSIONALS FOR TREATMENT, PREVENTION AND CONTROL

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Abstract: Investigation on knowledge, attitude and practice (KAP) of inhabitants and professionals for treatment, prevention and control of visceral leishmaniasis carried out on 519 inhabitants and 92 professionals of 6 districts (Panchagarh, Thakurgaon, Dinajpur, Bogra, Pabna and Shirajgonj) of Bangladesh. About 79.2% inhabitants agreed that they have heard about kala-azar disease. Regarding the transmission of kala-azar, 22.7% respondents answered by mosquito, about 38.3% said long period and irregular fever, 7.5% inhabitants knew enlargement of spleen and liver as sign and symptom of kala-azar. Among the professionals, about 80.4% of them have the correct knowledge regarding the specific agent (*Leishmania donovani*) of kala-azar. Investigation on knowledge, attitude and practice (KAP) of inhabitants and professional, 89.1% and 69.6% believe that spleen and liver are affected in kala-azar, 39.1% to 51.1% professionals understand that lymph nodes, blood and skin are involved as tissues due to kala-azar. Among the professionals, about 80.4% of them have the correct knowledge regarding the specific agent (*L. donovani*) of kala-azar.

Key words: Visceral leishmaniasis, KAP, symptoms, treatment, prevention and control.

INTRODUCTION

Kala-azar is a disease of reticulo-endothelial system of vertebrate (man), transmitted through the bite of sand fly where the promastigote form develop. The disease is mainly prevalent in rural areas where the people are living in substandard and unhygienic condition. Visceral leishmaniasis (VL), also known as kala-azar and black fever, is the most severe form of leishmaniasis is caused by protozoan parasite *Leishmania donovani*. Three clinically distinct leishmaniasis are recognized namely visceral leishmaniasis, cutaneous leishmaniasis and mucocutaneous leishmaniasis. The organism in visceral leishmaniasis was first described in 1903 by Leishman, who examined the spleen of a British soldier with kala-azar who had been stationed Dum-Dum (Shanmugham *et al.* 1977).

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It is the second –largest parasitic killer in the world (after malaria), responsible for an estimated 500,000 deaths each year worldwide (WHO 1993). The parasite affect the internal organs such as liver, spleen (hence ‘visceral’) and bone marrow and if left untreated will almost always result in the death of the host (Hossain *et al.* 1994). It is a disease of reticulo-endothelial system (RES) characterized by chronic irregular fever with progressive enlargement of the spleen and to a lesser extent liver, wasting of the body, anaemia, progressive leucopenia, raised erythrocyte sedimentation rate (ESR) (WHO 1993). The methods of transmission include congenital infection, blood transfusion and handling during inoculation of *L. donovani* (Chatterjee 1995). Kala-azar is prevalent in many parts of the world. Five countries, namely, Sudan, Nepal, India, Bangladesh and Brazil account for 90% of the global cases. Kala-azar affects largely the socially marginalized and the poorest communities (Mondal *et al.* 2008).

Kala-azar is one of the major public health problems in Bangladesh and the disease is endemic in Mymenshign division for few decades (Mondal *et al.* 2008). During the ‘Malaria Eradication Program’ through DDT spraying controlled all the transmission of vector borne diseases like malaria, kala-azar, filaria and dengue. In Bangladesh, kala-azar was a rarity in 1960s due to collateral effect of malaria eradication program of sand fly vector (Rahman 1983). But sporadic cases of kala-azar and dermal leishmaniasis were reported from Bangladesh and other parts of Bangladesh (Rahman and Islam 1989). During 1981-85 only 8 upazillas reported kala-azar which increased to 105 upazillas in 2004. During last few decades kala-azar has taken a shape of epidemic proportion with the number of cases according to the reported cases (Bern *et al.* 2007).

The new areas are being invaded every year posing a challenge for the control of kala-azar program (Bern *et al.* 2006). It is difficult to plot accurately the present geographical distribution of kala-azar and to determine their prevalence in man. Environmental and other changes may eliminate in some highly endemic foci or conversely may increase its prevalence in others. Though, the geographical distribution is worldwide except Australia, the local endemicity is usually sharply declined (Bern *et al.* 2006, 2007). In Bangladesh, most of the studies were conducted among susceptible cases and the prevalence of kala-azar was found higher than the present status. In other developing countries, the prevalence was also higher; Shanmugham *et al.* (1977) reported 50.35% in Madras, Ali and Ashford (1993) observed 36.4% in Ethiopia and 26% in Somalia studied by Shiddo *et al.* (1995).

In cutaneous form of leishmaniasis, parasites occur in nodules on the face, forearms, inner portion of the thighs and pubic regions. Post-kala-azar dermal leishmaniasis (PKDL) or dermal leishmanoid was first described by Brahmachary in India. Kala-azar is a threat in the public health problem in Bangladesh. It occurs in all age groups and the incidence is related with poor socio-economic conditions (Mondal *et al.* 2008). The present study was therefore

undertaken with the objectives – to assess the knowledge, awareness, concept, practices and their attitudes about Kala-azar among general population and health service providers (Professional) in the non-endemic part of Bangladesh.

MATERIAL AND METHODS

The present study was conducted in the non-endemic northern part of Bangladesh. Five hundred and nineteen inhabitants were selected under 15 upazillas of 6 districts (Panchagarh, Thakurgaon, Dinajpur, Bogra, Pabna and Shirajgonj). The present study was carried out from November 20, 2011 to September 30, 2012. A total of 519 inhabitants were divided in various categories such as- age, sex, occupation, education level, hygienic condition, socio-economic status, use of mosquito net, type of main house, presence and distance of cattle shed from the living room, etc. The study was conducted through direct interrogation of questions from a preset questionnaire.

RESULTS AND DISCUSSION

A total of 519 inhabitants of selected kala-azar non-endemic areas of 6 districts were carried out during November 20, 2011 to September 30, 2012. The percentages of male respondents were 64.4% and that of female were 35.6%. In the present observation, regarding the occupation of the inhabitants, the highest (32.8%) percentage of house hold heads or respondents have own agriculture field. The second highest were agriculture labors (22.9%) and next were business man (18.1%) and the lowest was housewives (8%) (Fig: 2).

Among the respondents, according to educational qualification, about 42.2% were illiterate and 20.8% were I-V class pass, only 3.1% graduate and 7.3% self educated (Fig: 3), 15% respondents were VI-X and 11.6% SSC/HSC pass. Regarding the distribution of the age-groups of the respondents, highest (28.9%) and comparatively the higher (25.2%) were in 30-39 and 40-49 years age-groups respectively (Fig 1). In the present observation, regarding the houses of the inhabitants, 35.5% and 33.9% were mud and tin house respectively, whereas, brick house was only 12.5% and thatch house was 16.6% (Table 1).

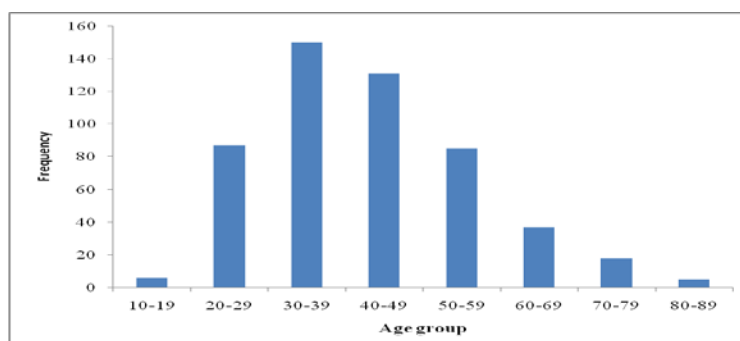


Fig. 1. Graph showing the age distribution (in years) of the respondents.

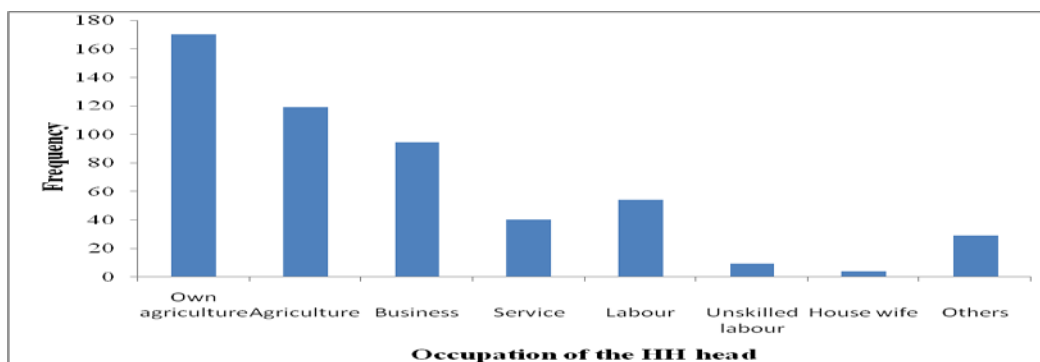


Fig. 2. Graph showing the frequency of the occupation of the house-hold heads.

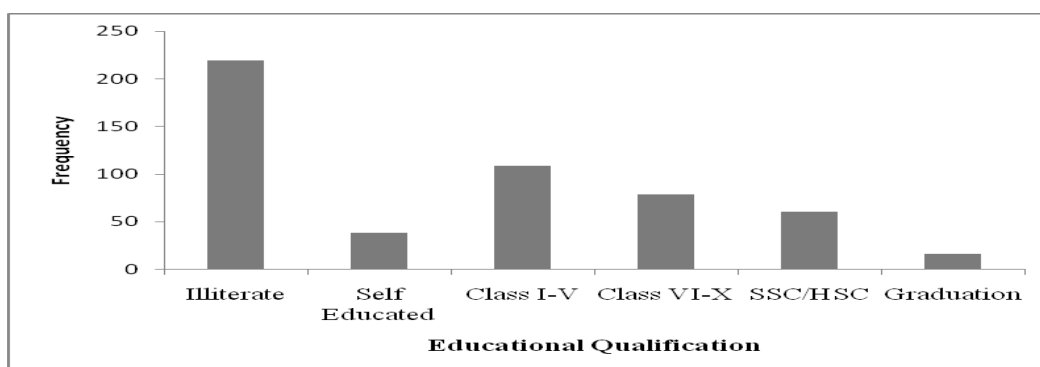


Fig. 3. Graph showing the educational qualification of the respondent

Table 1. House types according to category in the study area.

	House types	Frequency	Percent	Valid Percent
Valid	Mud House	184	35.5	35.5
	Thatch House	86	16.6	16.6
	Tin	176	33.9	33.9
	Brick House	65	12.5	12.5
	Other	8	1.5	1.5
	Total	519	100.0	100.0

Table 2. Distance of cattle shed from their living room.

	Distance	Frequency	Percent	Valid Percent
Valid	Up to 20 ft	282	54.3	57.3
	Up to 20-50 ft	45	8.7	9.1
	More than 50 ft	1	.2	.2
	NA	164	31.6	33.3
	Total	492	94.8	100.0
Missing	0	27	5.2	
	Total	519	100.0	

The distance of the cattle shed from the household, within 20 ft were 57.3% while, up to 20-50 ft were 9.1% only (Table 2). The inhabitants, in these rural areas, who have not heard about the kala-azar were in a great percentage (87.1%) and only 12.5% of the totals heard about kala-azar (Table 3); 57% of them use mosquito nets, and 28.5% use coil or mat, very few (5.1%) use smoke (Fig. 4)). Regarding the utilization of mosquito nets, in 76.5% households use for all members, 22.5% for some of the members (Fig. 5).

Among the professionals, about 80.4% of them had the correct knowledge regarding the specific agent *Leishmania donovani* of kala-azar, 5.4% said *Plasmodium falciparum* and 3.3% said *Wuchereria bancrofti* is the specific agent of kala-azar (Fig: 6). To assess the knowledge of the professionals, it has been observed that, about 40.7% of them believed that flies are the reservoir of kala-azar, while, 34.1% believed man is reservoir and 17.6% believe reservoir is mosquito (Table 4). Out of 16 RMO, 8 believe flies, 6 for man and out of 15 Senior Nurses, 4 think mosquito, 4 for flies, 4 for man and 1 for rat. Out of 13 Medical Assistant- UHC, 7 think flies are reservoir for kala-azar, 4 for man and 1 for mosquito (Table 4). About 84.8% - 85.9% professionals said pyrexia and spleen enlargement are the most prominent clinical features of kala-azar, while, 63% - 69.6% have concept about weight loss, anaemia, liver enlargement and skin discoloration as clinical features of kala-azar (Table 6).

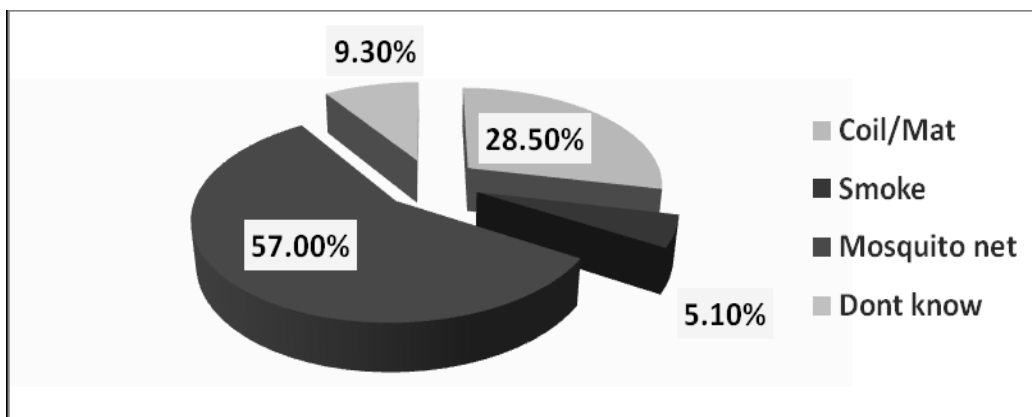


Fig. 4. Distribution of respondents regarding their knowledge about avoiding the bite of sand fly.

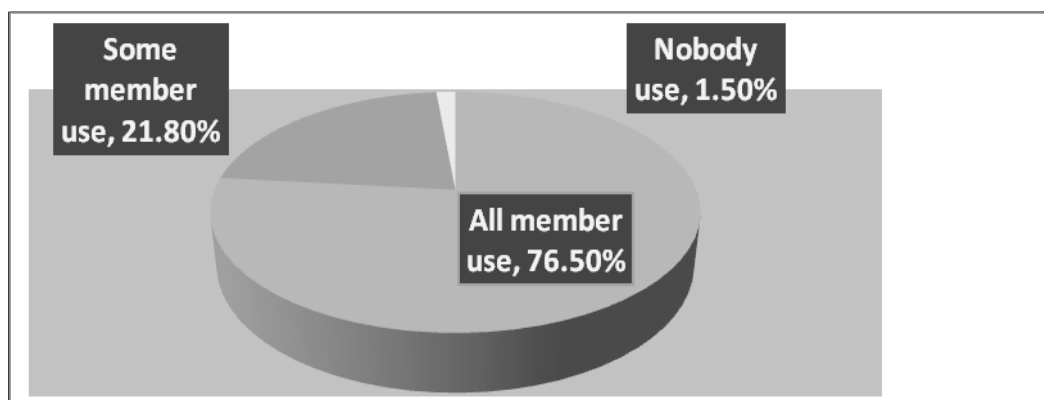


Fig. 5. Percentage of the respondents according to the utilization of mosquito net among the family members.

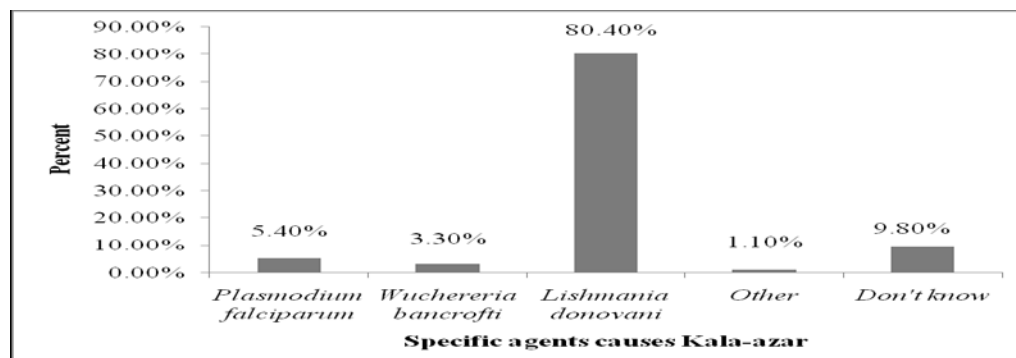


Fig. 6. The knowledge of professionals about the agent of Kala-azar.

Table 3. Respondents awareness (%) in different field related with Kala-azar.

	Yes
Percentage of respondents according to whether they have heard the name of kala-azar or not	79.2 %
Percentage of respondents regarding the knowledge about whether kala-azar is curable or not.	65.4 %
Percentage of respondents according to whether they have heard about sand fly.	12.5 %

Table 4. The knowledge of professionals regarding the reservoir of Kala-azar in humans.

	Knowledge on	Frequency	Percent
	Mosquito	16	17.4
	Flies	37	40.2
	Man	31	33.7
	Rat	1	1.1
	Other	6	6.5
	Total	91	98.9
Missing	99	1	1.1
Total		92	100.0

Table 5. Category of professionals the knowledge regarding the transmission of Kala-azar.

Category		Reservoir for Kala-azar					Total
		Mosquito	Flies	Man	Rat	Other	
Designation/ Job details	UHFPO	1	3	9	0	0	13
	RMO	2	8	6	0	0	16
	MO	1	6	4	0	3	14
	Senior nurse	4	4	4	1	2	15
	SACMO	1	5	2	0	0	8
	Medical Assistant-UHC	1	7	4	0	1	13
	Medical Assistant-USC	6	4	2	0	0	12
Total		16	37	31	1	6	91

Most of the UHFPO, RMO and MO understand that severe anaemia and ultimately death are the consequences of not treating of kala-azar. Commonly, 73.9% think that severe anaemia is the consequences of not treating of kala-azar. About 21.7% - 53.3% of the professionals have knowledge that loss of skin sensation, renal failure, cachexia and hepatic fever are the consequences of not treating kala-azar (Table 7).

Table 6. Knowledge of professionals about clinical features of Kala-azar.

Clinical features	Cases		
	Valid	Missing	Total
	N	Percent	N
Pyrexia	78	84.8%	14
Abdominal swelling	49	53.3%	43
Weight loss	64	69.6%	28
Anemia	56	60.9%	36
Spleen enlargement	79	85.9%	13
Liver enlargement	61	66.3%	31
Skin discoloration	58	63.0%	34
Bloody diarrhea	5	5.4%	87
Lymph node swelling	33	35.9%	59

Table 7. Professional's knowledge regarding the consequences if not treating Kala-azar.

	Cases				
	Valid		Missing		
	N	Percent	N	Percent	Percent
Spontaneous cure	9	9.8%	83	90.2%	100.0%
Hepatic failure	49	53.3%	43	46.7%	100.0%
Valvular heart disease	8	8.7%	84	91.3%	100.0%
Severe anemia	68	73.9%	24	26.1%	100.0%
Renal failure	22	23.9%	70	76.1%	100.0%
Cachexia	38	41.3%	54	58.7%	100.0%
Loss of skin sensation	20	21.7%	72	78.3%	100.0%
Dementia	4	4.3%	88	95.7%	100.0%
Death	68	73.9%	24	26.1%	100.0%

Table 8. Knowledge of professionals regarding the drug are used for treatment of Kala-azar.

	Drug	Frequency	Percent
Valid	Chloroquine	1	1.1
	SAG	79	85.9
	Metronidazole	2	2.2
	Parmomycin	2	2.2
	Eiethylcarbamazine	1	1.1
	Miltefosine	3	3.3
	Amphotericin B	2	2.2
	Total	90	97.8
Missing		2	2.2
Total		92	100.0

The present investigation revealed that, about 87.8% of the professionals understand that SAG is the drug should be used for treatment of kala-azar (Table 9), while, 1.1% - 3.3% of the professionals support the application of Eiethylcarbamazine, Miltefosine, Metronidazole and Parmomycin drugs are used for kala-azar (Table 8). Kala-azar or visceral leishmaniasis is a vector-borne parasitic disease that affects the cells of the mononuclear phagocytic system (MPS) of the body of human. In Bangladesh, increasing trend of incidence of kala-azar is observed. Most prevalent areas are Sirajganj, Pabna, Tangail and Mymensingh (Alam *et al.* 2009, Musa and Khanum 2009).

In Bangladesh, the situation of kala-azar tensed to be epidemic in multiple foci and inter-epidemic period used to be every 15-20 years interval. So it need muss sero-survey and control program to avoid the kala-azar epidemic problem. Visceral leishmaniasis can be complicated by serious secondary bacterial infections such as pneumonia, dysentery and pulmonary tuberculosis, which often contribute to the high fatality rate of patients. Others complications include hemolytic anemia, acute renal damage and severe mucosal hemorrhage (WHO expert committee report, 1991). The incubation period is highly variable; the disease can appear anytime between ten days to over one year (Bern and Chowdhury 2006, Hasan *et al.* 2010). Kala-azar has a high mortality rate and gives rise to important public health problems ((Manson, 1982, Thakur 1984, Khanum *et al.* 2008). The majority of cases are reported in the age group 5 to 30 years. The ratio of prevalence among male and female was 2:1 (Masum and Chowdhury 1996).

In case of sand fly, the environment management methods for control are generally directed at the elimination of breeding sites in and around house. The breeding habitats though difficult to locate and destroy. The places around houses and cattle sheds should be kept clean and plastered at regular intervals. The cattle shed, lose soil and organic materials should be removed daily (Hasan *et al.* 2010).

The present study has been done to assess the basic concept and knowledge regarding the disease kala-azar, its sign and symptoms, mode of transmission, prevention, vector control and course of treatment for kala-azar. It is expected that, the findings of the present study will contribute to future planning for development of knowledge, training of the professionals and health workers, prevention and control of kala-azar in endemic areas of Bangladesh. More efforts should be given by the Government and health workers should be given efforts to raise the awareness about kala-azar in the communities.

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