

A NEGLECTED OLD DISEASE IN A NEW FOCUS: EPIDEMIC OF VISCERAL LEISHMANIASIS

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ABSTRACT

Objective: *to describe the clinical and epidemiological features, treatment measures and the case fatality rate of patients with visceral leishmaniasis (vl) in libo-kemkem woreda.*

Methods: *Retrospective descriptive analysis of demographic and epidemiologic data from patients with visceral Leishmaniasis diagnosed and treated in Addis Zemen health center and outreach sites at Libo-kemkem Woreda North West Ethiopia from may 2005 to January 2006.*

Results: *Two hundred twelve deaths which occurred before the epidemic of visceral Leishmaniasis proper got confirmed were believed to have died due to Kala-azar (KA). Those deaths which occurred before the epidemic was actually confirmed and the 1292 patients diagnosed and treated for KA were included in the study. The age of patients ranged from 5 months to 60 years whilst the mean age was 18 years. Of the 1292 patients who were diagnosed and treated at the health center, 25.3 % were female and 58% came from Bura kebele of Libo-kemkem Woreda. Associated infections were diagnosed in 10.9 % of the admitted patients. Patients were treated with Sodium Stibogluconate (SSG). The death rate was 3.8%. The documented main immediate causes of death are associated infections like tuberculosis with respiratory failure and sepsis.*

Conclusions: *We have to be aware that Kala azar is expanding its horizon and is becoming a serious public health problem, therefore it is necessary to empower health workers on early recognition and appropriate management of visceral Leishmaniasis and its complications. More importantly, appropriate laboratory kits and drugs must be available in selected areas to early diagnose and treat patients. Control measures must be intensified to curve the rising epidemic.*

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Introduction

Visceral Leishmaniasis (VL), commonly known as Kala-azar is a human systemic disease caused by parasitic protozoan species of the genus **leishmania**. It is transmitted by the bite of the tiny and seemingly innocuous female phlebotomine sandfly (1- 3)

Depending on the species of the parasite and the immune response of the host, the clinical spectrum of Leishmaniasis **ranges from self- healing skin lesions** to a fatal systemic disease called visceral Leishmaniasis (VL) or Kala azar (KA) (1, 3).

Visceral Leishmaniasis may occur sporadically throughout an endemic region or may occur in epidemic foci. An increased number of cases and large numbers of deaths have been reported in some new focuses.

Visceral Leishmaniasis is endemic in the tropical and sub-tropical regions of Africa, Asia, the Mediterranean, Southern Europe, South and Central America. The distribution of VL in these areas however is not uniform; it is patchy and often associated with areas of drought, famine and densely populated villages with little or no sanitation. In endemic areas children below the age of 15 are commonly affected. In sporadic and

epidemic cases of VL people of all ages are susceptible with males at least twice as likely to contract the disease as females, except those who have conferred immunity due to past infection. Leishmaniasis is most prevalent in rural areas (5, 6).

Leishmaniasis is common in the north western part of Ethiopia bordering the Sudan and Eritrea (7). There are also reports in the south west part of the country mainly in Konso and the central part of the country North Shoa of Amhara (8, 9, 10).

Leishmaniasis has not been reported from Addis Zemen previously and is not included in the Integrated Disease Surveillance Response (IDSR) in Ethiopia (include the corresponding Ref.). However since September 2004 it has caused a lot of sickness and death in one of the Woredas of south Gonder called Libo-kemkem. As part of the epidemic control measure, and to learn its specific Epidemiological features in this particular area, we investigated the Epidemic. The particular aim of the investigation was to describe the epidemic namely: to know who were affected, which localities are hardly affected by the epidemic, when the Epidemic occurred, what other studies are required to know more about the disease in this area.

Methods

The study area

Libo-kemkem is in south Gonder zone and is one of the 113 Woredas of Amhara Region. It is divided into 29 rural and 4 urban Kebeles. The landscape is mountainous and plain low land. The lowland part of the Woreda is partly covered with Acacia trees and the soil is black which cracks deeply during the dry season. Small-scale irrigation is started in the plain low land part of the Woreda. The area is highly populated and a lot of stray dogs are found in every village. The main health provider in the Woreda is the government. During the study period there were one health center and 11 health posts for around 230,000 people. Malaria is the first cause of morbidity and mortality in the Woreda.

Confirmation of the Epidemic.

The cause of the epidemic went unrecognized for more than eight months. As the main cause of febrile illness in the area is malaria, the illness was diagnosed as malaria. Repeated investigating teams went to identify the cause of the epidemic but failed to suspect Kala azar. The patients were being managed as malaria. As the illness was not responding to the latest anti-malarial drugs the community refused to take these medicines, they rather used to go

to the holy water. Finally, people experienced with the treatment of Kala azar (MSF- Greece) went to the area to see the “malaria” situation in the localities. At this moment, they considered Kala azar and investigated patients. The first thirteen specimens were taken to Abderafi and turned out to be positive with DAT. To confirm the etiology The Regional Health Bureau took five patients to Gonder university hospital, all of them confirmed to have *L. donovani* from their Splenic aspirate.

Treatment of patients

The first thirteen patients were sent to Abderafi health center for treatment and at the same time a treatment center was established at the Addis Zemen health center. The south Gonder zone and the Regional Health Bureau deployed five health workers to assist the Woreda and MSF- Greece on the management of cases. The MSF-Greece trained all health workers involved on the management of KA. The Treatment center was established at Addis Zemen on 20 May 2005. As the cases were too many for the health center, outreach sites were established at three Kebeles near the patient’s homes until they completed the 30 day injection. CARE donated one big tent and patients were treated in the health center

under tents. Treatment included drugs and nutritional rehabilitation. As part of the treatment protocol patients were weighed at admission and the nutritional status was being assessed.

Treatment for visceral leishmaniasis was A 30-day course of 20 mg antimony per kg body weight which is available under different brand names (Pentostam, Glucantime, S.A.G)

Identifying additional cases

At the beginning of the Epidemic (immediately after the 13 patients were tested and proved to be positive for DAT), the wereda health office with the assistance of WHO surveillance officer and MSF – Greece developed case definition, planned the care of patients and documentation. A form for data collection was developed and given to the wereda DPC focal person and head of the health center. More over the epidemic affected area was visited by the team to assess the geographical features of the area and examine patients at the site. Additionally, orientation was given on how to investigate the Epidemic especially on how to find additional cases and manage them.

Data collection and analysis

The Woredas Health Office was collecting information on deaths even before the cause of the epidemic was identified. After the cause of the epidemic was known, data was collected by the health workers attending patients. These Health workers in addition to their training on how to manage Kala azar cases they were also trained on how to fill the registration form prepared by the wereda Health Office and WHO Surveillance Officer. The health workers collected the information based on the prepared registration form. The variables collected using the registration form were entered into a computer and analyzed using EPI INFO version 2002. The result of the descriptive analysis is presented using frequency table and graph. This analysis included both: the data collected by the wereda Health Office before the cause of the epidemic was known and the record of patient after the cause of the epidemic was known, from May 20, 2005 to January 15, 2006.

* The author was a WHO surveillance officer who supported the outbreak investigation in the health facility and at the field level and has no conflict of interest of any kind

Result

There were two hundred twelve deaths during the eight months before the diagnosis of Kala azar was confirmed, these deaths occurred despite treatment with the latest anti-malarial drug and retrospectively were believed to be due to Kala azar. The admission of Kala azar cases started on 25 May 2005 at Addis Zemen health centre. Since the diagnosis of Kala azar was confirmed, 1,928 people were tested with DAT and 1,292 (67%) of them were positive.

Of the DAT positive patients, twenty-five of them had splenic aspiration and parasitological examination; 23/25 positive LD. We have learnt that 67% of patients who fulfill the cases definition were found to be DAT positive and 16% borderline. Of DAT positive in 92% of them the parasite was identified from the splenic aspirate.

Among the DAT positive patients who were on Treatment 74.8 % are male The mean age of patients was 18 years, the range being from 5 month to 78 years, but the majority of them being between 5 and 35 years (table 1). In the age group of five years and below there is no significant difference in sex of cases but as the age increases, the disparity of cases between the sexes increases. The

age distribution of deaths before the epidemic was confirmed and cases under treatment also have similar pattern except that there were relatively more deaths than cases in the under five years of age group (Table2).

The epidemic started from one of the Libo-kemkem Woreda and gradually the number of Kebeles affected increased. As of January 15, 2006, there were reports of cases from 20 of the 33 Kebeles including from one of the urban Kebeles. 743 (58%) of the cases were reported from one of the Kebeles called Bura. 1008 (78.6 %) of the cases were reported from the 4 Kebeles of the Woreda. There were 18 cases from neighboring Woreda (Fogera) who came for treatment at Addis Zemen treatment center.

Before the diagnosis of KA was confirmed, the death due to possible cause of KA was very high, after the diagnosis was confirmed and treatment center established death has decreased dramatically but the numbers of cases requiring treatment are increasing. By the time this report was prepared there was no sign of decrement in the reported incidence of Kala azar cases; rather it is increasing with time (Fig. 1).

The additional health problems recognized on the above patients were infection 10.9 %

(tuberculosis, sepsis etc), severe acute malnutrition 25.9 % and moderate acute malnutrition 11.1 %

The duration of the symptom of Kala azar patients at diagnosis were highly variable it ranges from a month to a year the mean duration is 50 days.

The main treatment modality was Sodium Stibogluconate (SSG) intramuscular and Nutritional rehabilitation. Since the health center has only 10 beds they were being cared in the tent. Sixty two percent of the patients before CARE gave the tent in October 2005 were treated at the outreach site. Except 18, all patients at the outreach sites have completed the treatment. After diagnosis was confirmed and as of January 15, 2006 there were 48 deaths the case fatality rate after initiation of treatment is 3.8 % (excluding those who disappeared against medical advice). Patients usually die after mean 12.1 days of hospital stay; the range is from three to 21 days of treatment. One of them died after discharge against medical advice.

There were 8 cases who gave a travel history to Kala azar endemic areas within the Region and few of them have a history of treatment for Kala azar; One of them went to Metema 5 months before the onset of the first possible KA case in Addis Zemen.

Discussion

The deaths before the cause of the Epidemic was confirmed were compared with cases after Kala azar was confirmed. It was found that there was similar pattern between the two groups in terms of sex, age or residence and clinical symptoms. The deaths occurred despite treatment with Co'Artem, the latest anti- malarial drug in the country. The fact that the clinical picture, age and sex distribution pattern of those who died before treatment started and those who was confirmed to have KA and started on treatment is similar; increased the probability of the cause of deaths to be due to similar illness. These show the long lag time to recognize the cause of the epidemic and how ill prepared we were to handle the situation (12).

The diagnosis is suspected and established very late, this indicates that opportunities for early diagnosis have been lost. This must be a cause for concern since late diagnosis is a risk factor for death (2, 14). Though Leishmaniasis is reported in many parts of the country (10), it often is perceived as a problem of low priority. Likewise, Leishmaniasis is known to occur frequently in many foci, but often the strategy is to

react rather than to anticipate and prevent (11, 13).

Factors that possibly could have contributed to this perception of low priority include:

1. Lack of information about the current magnitude or nature of the potential problem, i.e. KA.
2. Budgets are inadequate and health offices are overstretched with many calls on their resources.
3. In this area, hospital facilities are absent and tools for screening and identification of patients are not available; and, overall, the population to health care facility distribution disparity within the Libo-Kemkem woreda was huge at the time.
4. Health workers in the affected communities were ill prepared on diagnosis and treatment of KA in particular.
5. There was no enough knowledge about the most effective points of intervention in the case of KA at least.

Duration of illness: The great variation in disease duration before admission is in line with published data. Leishmaniasis is generally an insidious disease, with non-specific initial symptoms, this in conjunction

with potential bias due to faulty memory and the low educational level of the populations makes this variable particularly difficult to interpret (14).

Inconformity with many of the literatures this investigation suggests that the male is more prone to this disease, this might be to nature of the work in the field and activity pattern for male. There may also be a hormonal factor linked to gender or exposure (5). This requires further study on type and residence of the vector and hormonal difference of male and that might contribute for the difference in the incidence of the disease.

One important characteristic of visceral Leishmaniasis is that the higher the incidence of the disease the greater the risk to the youngest Children (1,4,14). But in this series the under five children are not the highest affected children. This might be due to equal susceptibility of the community in new focus or the behavior of the vector (residing and biting in the forest where usually adults penetrate)

Nutritional evaluations revealed the disease has wide range of clinical variation, demonstrated by the presence of patients within the normal weight percentiles (63% of the patients), while 25.9 % of patients were severely malnourished. It should be

noted that a majority of the patients had suffered from the disease for less than 60 days; a period, which may well, not be sufficient for chronic nutritional problems to develop and which may explain the presence of well-nourished patients.

We were not able to determine the route by which VL entered the villages of Libo-kemkem. The only information we could demonstrate was the patient who has been to Metema and came back to Libo-kemkem Woreda 5 months before the first surviving case. Though there was no documented information of Kala azar in Libo-kemkem Woreda, as we didn't investigate the travel history of the deaths before the cause of the epidemic was known, it is difficult to conclude this case as the index case.

Climate, soil type and agricultural practice are factors that influence the disease pattern (15,16), the number of cases of Leishmaniasis is increasing, mainly because of man-made environmental changes and the absence of intervention to control the spread that may help to decrease human exposure to the sandfly vector, and the movements of susceptible populations into endemic areas also contribute to the increased incidence. Therefore we have to be aware that Kala azar is expanding its

horizon in areas where small scale irrigations are developing and is becoming a serious economic and public health problem. Excluding the deaths at home before the diagnosis was ascertained the reported cases fatality after the diagnosis was ascertained was 3.8% from admitted patients, which was similar to rates in other studies (14). It can, however, still be considered lower when compared with some other study lethality rates. The lower reported case fatality rates found in this study may be due to the fact that active case search might have pulled the cases that are of a lesser severity, thus admitting a patient that have lower risk of death.

Conclusion and recommendation

As patients may die unattended in their home, strengthen active surveillance to pinpoint other affected villages, and improve the efforts to increase availability of diagnostic and treatment facilities.

We have to build the knowledge on epidemiology, ecological types, and designing a sound VL control strategy. As the study is a descriptive one, it should be enriched by studies that focus on the type and behavior of vector, mode of transmission, reservoir host and of the

species of the parasite in the locality, which in turn helps to design a control strategy.

We have to be aware that Kala azar is expanding its horizon, new woredas where has been no case report previously are reporting cases and the disease is becoming a serious public health problem, therefore it is necessary to empower health workers on early recognition and appropriate management of visceral Leishmaniasis and

its complications. More importantly, appropriate laboratory kits and drugs must be available in selected areas to early diagnose and treat patients. Until we know the behavior of the parasite and will be able to design a specific control strategy, the already known and readily available generic control measures must be intensified to curve the rising epidemic.

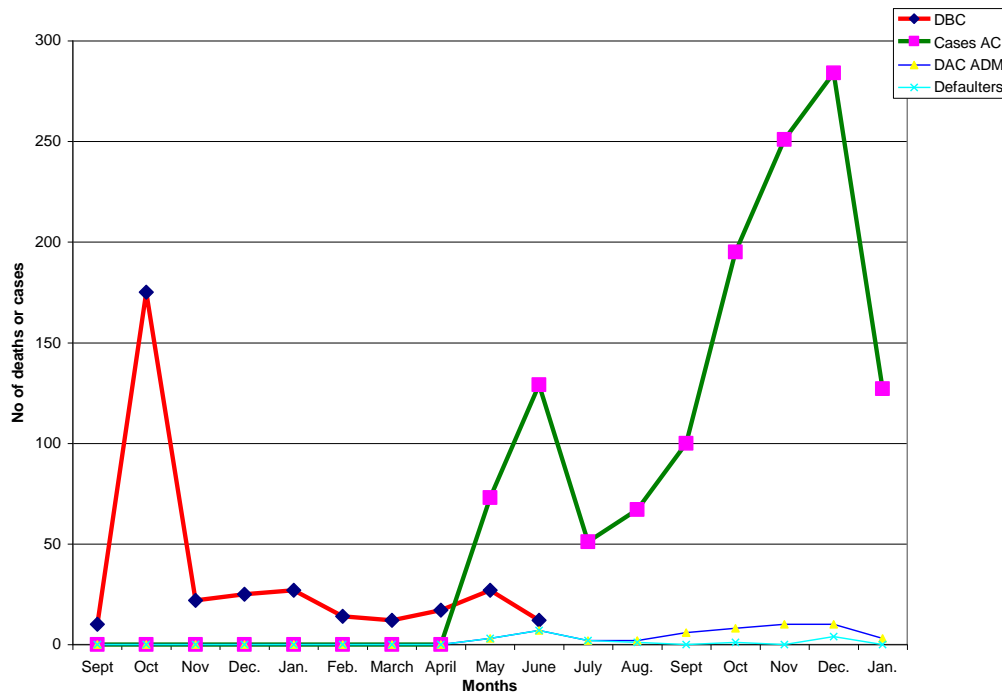
Table 1: Distribution of Confirmed KA cases by age and sex Addis Zemen, North west Ethiopia, May 2005- January 2006

Age group	Sex					
	Male	percent	Female	percent	Total	percent
<=5	119	54.8%	98	45.2%	217	16.9%
>=5-20	460	75.9%	146	24.1%	607	47.3%
>20 - 35	262	82.1%	57	17.9%	319	24.9%
>35 - 50	79	80.6%	19	19.4%	98	7.7%
>50 - 60	27	96.4%	1	3.6%	28	2.2%
>60	13	100.0%	0	0.0%	13	1.0%
Total	960	74.9%	321	25.1%	1282	100.0%

Table 2: Age distribution of Kala azar cases on treatment and presumed KA deaths before the causes was known Addis Zemen, north west Ethiopia, September 2004- January 2006

Age group	Patients on treatment		Deaths before confirmation	
	No	%	No	%
<=5	217	16.90%	50	27.50%
>5 – 20	607	47.30%	18	9.90%
>20 – 35	319	24.90%	69	37.90%
>35 – 50	98	7.60%	36	19.80%
>50 – 60	28	2.20%	4	2.20%
>60	13	1.00%	5	2.70%
Total	1282	100.00%	182	100.00%

Fig 1: Trend of Kala azar deaths before its confirmation and deaths and cases after it was confirmed Addis Zemen, North west Ethiopia September 2004- January 2006



Key

DBC= deaths before confirmation

DAC=deaths after confirmation

CASES AC = cases after confirmation

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