

Kala-Azar Fortnightly Elimination Strategy for Young Population in Uttar Pradesh

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Abstract

Introduction: Kala-azar (KA), the most severe form of leishmaniasis, is a parasitic disease transmitted by the bite of infected female sandflies. It affects poor communities and causing significant health, social and economic impact. All the affected countries are committed to eliminate KA by 2017. For which early case detection and complete case management of Kala-Azar is important strategy to stop transmission.

Objectives: To reduce the annual incidence of Kala-azar to less than one per 10,000 population at block level by the end of 2017 through kala azar elimination strategy.

Method: Kala Azar Fortnight was observed in 149 villages of 37 blocks of 9 endemic districts in the year 2016 (February 13, 2016 to February 27, 2016) and (May 01, 2016 to May 15, 2016) with rapid diagnostic kits rK39 to screen all the suspected patients and subsequently were referred to PHC/CHC/district hospitals /Medical Colleges for their further treatment.

Result: In year 2016, a total of 107 cases were detected from different villages of affected districts in Uttar Pradesh. Out of which 23 cases are male in the age group of <15 year and 17 cases are female in the age group of <15 year.

Conclusion: Large number of kala azar cases were of younger population who needs to be treated urgently to avoid HIV/TB co-infections and complication.

Keywords: Leishmaniasis, rK39, Adolescent, Rural Uttar Pradesh

Introduction

Kala-azar is a parasitic disease transmitted by the bite of infected female sandflies. It affects poor communities and causing significant health, social and economic impact. Without treatment, it is fatal in almost all cases. India and Bangladesh are among the most severely affected countries in the world, while in WHO's South East Asia region, Nepal and Bhutan have reported cases as well. Strategic Framework for elimination of Kala-azar from the South-East Asia Region (2011-2015) includes:

- Early case detection & complete case management
- Integrated Vector Management and Vector Surveillance
- Supervision, monitoring, surveillance and evaluation
- Strengthening capacity of human resource in health

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- Advocacy, communication and social mobilization for behavioral impact and inter-sectoral convergence
- Programme management

As per National Health Policy, KA should have been eliminated by 2010, which was revised to 2015. During 2014, Health Ministers of Bangladesh, Nepal and India renewed the memorandum of understanding to achieve KA elimination by 2017 or before. Kala-azar without treatment is fatal in almost all cases. India and Bangladesh are among the most severely affected countries in the world. Around 90% of VL in India and almost half of the global burden occur in Bihar, a state in northeast India, with a population of more than 100 million. Afflicted by poverty, this region also is home to large numbers of migrant workers who travel to and from the major cities in the region. There are 3 main forms of the disease:

- Visceral leishmaniasis (VL), which is also known as kala-azar, can cause even death if left untreated in over 95% of cases. It is characterized by irregular bouts of fever, weight loss, enlargement of the spleen and liver, and anaemia. It is endemic in some states of the Indian subcontinent. An estimated 50 000 to 90 000 new cases of VL occur worldwide each year
- Cutaneous leishmaniasis (CL) is the form of leishmaniasis which causes skin lesions, mainly ulcers, on exposed parts of the body, leaving life-long scars and serious disability
- Mucocutaneous leishmaniasis form leads to partial or total destruction of mucous membranes of the nose, mouth and throat

Human immunodeficiency virus (HIV) coinfection of VL has been identified as an emerging challenge for VL control. HIV infection dramatically increases the risk of VL and, conversely, VL accelerates HIV disease progression. Historically, VL–HIV coinfection prominently emerged in Europe in the early 1990s, where up to 60% of VL cases were co-infected. With the introduction of antiretroviral therapy (ART) in the late 1990s, the incidence of new VL–HIV cases gradually declined. The problem is now severe in some parts of eastern Africa, particularly Ethiopia, where up to 40% of VL patients are HIV co-infected. In Brazil, coinfection was documented in 6% of VL cases in 2011.

As per the literature, Human immunodeficiency virus (HIV) and visceral leishmaniasis (VL) are both endemic in the state of Bihar, and Uttar Pradesh in eastern India. There is 40% worldwide burden of *Leishmania donovani* in Bihar. A rising prevalence of HIV infection (currently estimated at 0.22%–0.33%) and a rapidly rising population, HIV–VL coinfection could be a growing concern for the region. However, exact data are unavailable on the prevalence of coinfection in Bihar. In the state like Bihar and Uttar Pradesh, the common situation is that HIV testing is neither routinely performed nor required under national

guidelines for patients with VL in India. Consequently, this fact that coinfection, which is a serious public health issue, a challenge remain in the Indian subcontinent.

43.9% of the asymptomatic seropositive contacts of KA patients developed KA within the first 3 months, and a cumulative total of 69% developed KA within 1 year. Due to this reason, localized mass screening of serological (e.g., rK39 antigen) test should be done in the susceptible population residing in these areas where KA (visceral leishmaniasis) is endemic, e.g., Bihar, UP, West Bengal in India and Bangladesh and Nepal.

Asymptomatic cases can become symptomatic when co-infected with HIV/AIDS. Further, co-infected patients can serve as human reservoirs, having numerous parasites in their blood and becoming a reservoir and source of infection for the insect vector. So far, the strategy with KA is that treat all symptomatic after confirmation with RK-39 rapid diagnostic test besides vector control. It is logical strategy to treat all RK-39 positive patients because asymptomatic patients can become symptomatic later and can also become reservoirs of infection. In Uttar Pradesh 6 districts are endemic to Kala-Azar having bordered with Bihar additionally 3 new districts identified to report Kala-Azar cases. There is an emergent need to reduce Kala-azar transmission especially in adolescents to prevent the emergence of Kala-azar and HIV/TB co-infections in endemic areas.

To reduce the annual incidence of Kala-azar to less than one per 10 000 population at block level by the end of 2017 through elimination strategy adopted by India and neighboring countries.

Methods

The detection of all cases of kala-azar, and their treatment is an imperative necessity for reducing parasite load in the community and identifying all disease foci for undertaking intervention measures to eliminate kala-azar. There are two approaches for case detection: i) passive case detection, and ii) active case search.

For finding out undetected cases of kala-azar door to door searches have been organized under the Kala-azar Control Programme through a 'Fortnight' of domiciliary visits in the villages of the endemic districts, by the health workers and volunteers, who by interpersonal interaction with the community members, elicit the presence of suspected cases of kala-azar and PKDL according to the case definition. These suspected cases are referred to the PHC or to the camp where Medical officer examines them for confirmation and initiation of treatment. The onset of the disease is throughout the year in view of its long incubation period. Therefore, it is necessary to carry out 2-3 active case searches in a year.

KA Fortnight

KA Fortnight was observed in 149 villages of 37 blocks of 9 endemic districts in the year 2016 (February 13, 2016 to February 27, 2016) and (May 01, 2016 to May 15, 2016) with rapid diagnostic kits RK-39 to screen all the suspects and the suspected patients were referred to PHC/CHC/district hospitals /Medical Colleges for their further treatment.

KA fortnight was observed throughout the year in 2016 during which house to house visit for all suspects was carried out and all suspected patients were mobilized to block PHC for rapid diagnostic test. All the cases were line-listed and systematic collection of reports was followed on specified format, also specific IEC and meetings were organised in the affected areas to aware people for participation.

Data was collected on the specified formats and analysis was done on Microsoft excel. The early cases were found out through the history of any previous KA infection in the family, any presenting symptom such as case presenting to a clinician with a fever of more than two weeks duration, with splenomegaly and not responding to the full course of anti-malarials, pain abdomen, hepatomegaly, loss of weight, anorexia. Rapid diagnostic kits rK39 was used for the diagnosis of suspects.

Case of Kala-azar is defined as a person from an endemic area with fever of more than two weeks duration and with splenomegaly, who is confirmed by an RDT or a biopsy.

Probable PKDL is a patient from an area endemic for kala-azar with multiple hypopigmented macules, papules or plaques or nodules with no sensitivity loss and positive with rK39.

Confirmed PKDL is the patient from an area endemic for kala-azar with multiple hypopigmented macules, papules, plaques or nodules who are parasite or PCR-positive in a slit skin smear or biopsy.

rK39 Rapid Diagnostic Test

Now a rapid dipstick test based on the recombinant K39 protein is available for rapid diagnosis of kala-azar. K39 is an epitope apparently conserved on amastigotes of *Leishmania* species that cause visceral infection; by use of laboratory ELISA testing, circulating anti-K39, IgG is detectable in 95%- 100% of patients who have kala-azar, irrespective of geographic region. Using K39 antigen-impregnated nitrocellulose strips developed for field conditions, fingerstick-obtained blood and serum samples tested from Indian subjects demonstrated a positive anti-K39 immunochromatographic reaction in patients with aspirate-proven kala-azar; with an estimated sensitivity of 100% and a specificity of 97%. The strip testing proved simple to

perform and yielded results within five minutes.

The rapid diagnostic test when evaluated in comparison to the diagnostic performances of DAT, based both on freeze-dried and liquid antigens, on parasitologically confirmed Kala-azar and Post-Kala-azar Dermal Leishmaniasis (PKDL), the sensitivity of the tests was almost 100%, rK39 was found, to be more sensitive. It was concluded that these tests are comparable to parasitology in terms of their sensitivity and can replace parasitology as the basis for a decision to treat visceral leishmaniasis at peripheral health centers in endemic areas.

The recombinant antigen is a 39-amino acid (rK39) cloned in *Escherichia Coli*, from the C terminus of the kinesin protein of *Leishmania major* in India. The rK39 rapid diagnostic test has undergone extensive evaluation and has been found to be highly sensitive and specific in the diagnosis of both VL and PKDL.

The rK39 was not used in the following cases: Kala-azar relapses, in cases of kala-azar re-infection, and kala-azar and HIV co-infection.

Splenic aspiration

Splenic aspiration is one of the most sensitive and widely used procedures and sensitivity may be as high as 95-97%.

Data analysis

Data collected through passive and active search from 2011 to 2017 was analysed on excel sheet.

Results

As per data collection and analysis through the table 1, it is evident that there is increasing trend of VL cases since 2011 to 2017. In active search large no of undetected cases of kala-azar were diagnosed in fortnight campaign. In year 2015, 131 Kala -azar cases diagnosed and in year 2016, 107 Kala-azar cases diagnosed.

Out of 131 diagnosed KA cases in 2015 there were 33 male cases in the age group of >15 year and 27 female cases in the age group of >15 year. Out of 107 diagnosed KA cases in 2016 there were 41 male cases in the age group of >15 year and 26 female cases in the age group of >15 year, which indicates that there is increasing trend of Kala-azar cases in adolescents. There is emergence of Kala-azar and HIV/TB co-infections in endemic areas in vulnerable, poor and unreached populations especially in adolescents, which is a serious concern to to reduce Kala-azar transmission.

Active case search was also helpful in finding out the hidden KA cases in the community, with this active search 3 new district identified for having KA incidence in some blocks.

Table 1.KA Fortnight Report of UP for Year 2016

S.N.	District	No. Villages covered	No. of ASHA/ H.Worker trained	No. of Suspects identified
1	Varanasi	33	86	0
2	Ballia	21	630	31
3	Badohi	125	142	0
4	Deoria	453	721	594
5	Ghazipur	358	358	0
6	Kushinagar	107	741	75

Trends of KA cases since 2013 presented that there is increased detection in 2015 and 2016 in eastern part of

UP. These districts are border areas of the Bihar. Increase in cases detection is due to KA fortnightly.

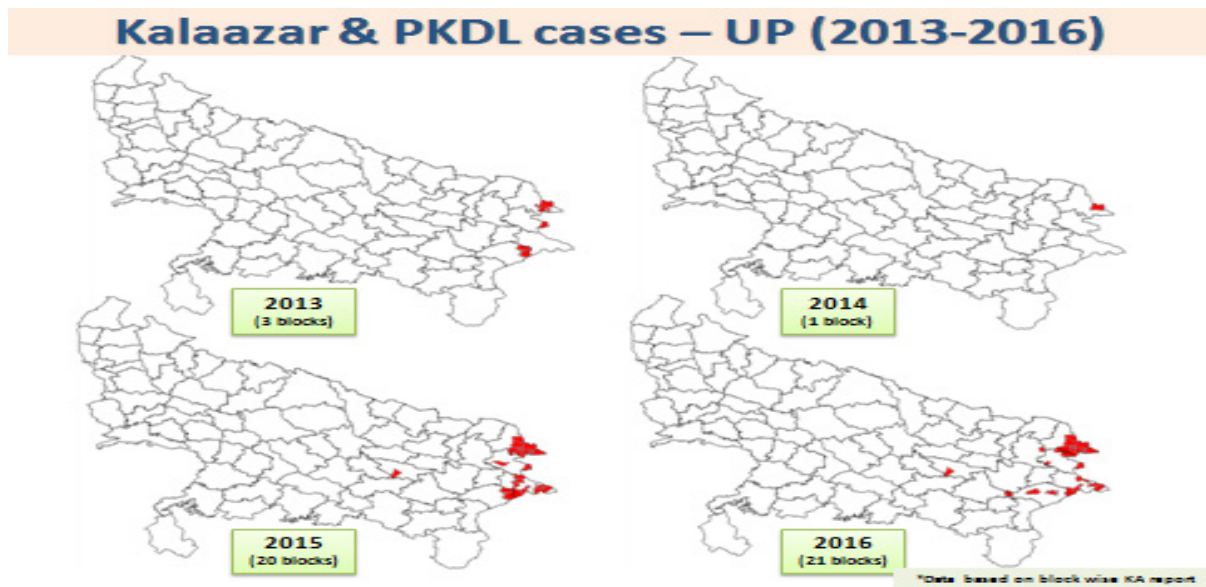


Figure 1.Spot map of Kala Azar caases since 2013 to 2017

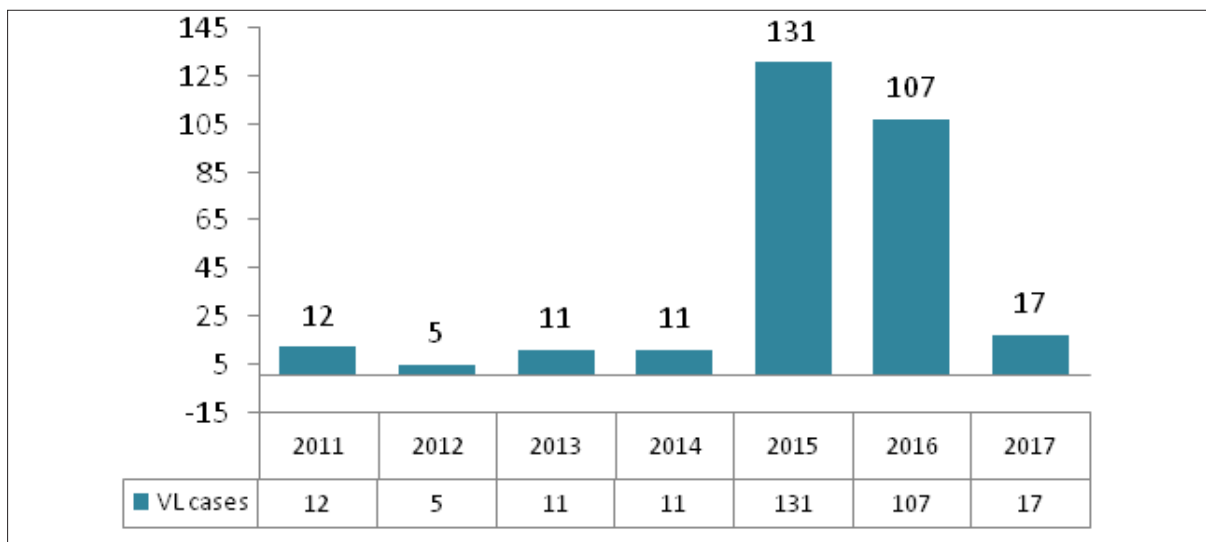


Figure 2.VL cases detected in the State from 2011 to 2017

Cases were more in males than females. Number of cases in younger population was high which as major concern important for elimination strategy.

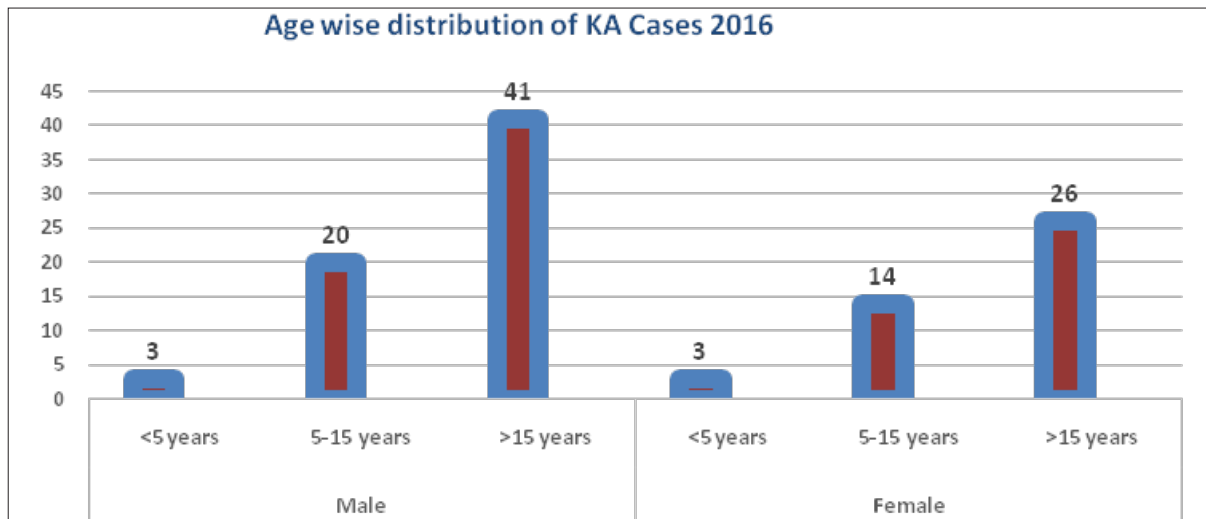


Figure 3. Age wise distribution of KA cases in 2016

Conclusion

Recent trend of prevalence of kala azar showed that it is increased due to KA fortnightly. There is an emergent need to reduce Kala-azar transmission in the vulnerable, poor and unreached populations especially in adolescents to prevent the emergence of Kala-azar in the area.

A rapid survey to assess hidden cases (KA/PKDL) should be launched. Such survey should be conducted in places where sudden increase in fever cases recorded. There should be mandatory testing of all KA/PKDL for HIV/TB and Vice-versa. Insecticide residual spray should be strengthened. Availability of drug and diagnostics in treatment center should be ensured and reporting and cross notification should be strengthened. IEC materials should be widely disseminated in general public regarding its transmission, symptoms and preventive measures.

Conflict of Interest: None

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