Visceral leishmaniasis in Bihar : A Brief Review

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Kala-azar has re-emerged from near eradication. The annual estimate for the incidence and prevalence of 'kala-azar cases worldwide is 0.5 million and 2.5 million, respectively. Of these, 90% of the confirmed cases occur in India, Nepal, Bangladesh and Sudan. In India, it is a serious problem in Bihar, West Bengal and eastern Uttar Pradesh where there is under-reporting of kala-azar and post kala-azar dermal leishmaniasis in women and children 0-9 years of age.

Leishmaniasis, a complex disease caused by the protozoan Leish-mania, is spread over large geographical areas around the globe. In India, the disease manifests in two forms: the cutaneous (dry and wet) and the visceral (kala-azar) variety. The disease may be sporadic, endemic or epidemic. About 500 species of six genera of the female Phlebotomus are suspected or proven vectors trans-mitting the parasites from animal-to-animal, animal-to-man and man-to-man. In India, the conditions that favour epidemics of kala-azar are rural areas more than 600 metres above sea level, India heavy annual rainfall, mean humidity above 70%, a temperature range of 15°C to 38 °C with a diurnal variation of more than 7°C, abundant vegetation, subsoil water and alluvial soil.[1]

In India, there have been several outbreaks of kala-azar since the last century. Various programmes to control the disease have failed despite considerable work being done on various facets of the disease However, information on the epidemiology of kala-azar in India is scanty. Nonetheless, the available information will be useful to understand the present status of the disease, its prevalence during the last couple of decades and allow the formulation of more effective strategies for its control.

BURDEN OF KALA-AZAR IN INDIA-The treatment of kala-azar is expensive, time-consuming and painful. The cost of a World Health Organization-recommended course of first-line treatment with antimonials is US$ 60—120 and the minimum expenditure incurred on the boarding and lodging of two relatives of each patient has been estimated at US$ 92-225.[3] This does not include the cost of nursing care and that of health care delivery. Untreated cases of kala-azar are associated with up to 90% mortality. The mortality with treatment has been reported to be 15% in some parts of the world and 3.4% in specialized hospitals. In India, where a little over 50% of the population has access to health care, the mortality is likely to be much higher. In the pre-DDT era, the Nowgong district of Assam had recorded depopulation due to kala-azar. In Sudan, in a protracted outbreak of kala-azar spanning 10 years, the mortality reached 57%.

The earliest recorded outbreak of fever which could be ascribed to kala-azar was in 1824-25 in Jessore (presently in Bangla-desh). It probably first appeared in Bihar in 1882, and in Assam in 1869 in the Garo Hill district (presently in Mizoram). A large number of cases were also reported from Tamil Nadu. Sporadic cases have been reported from Gujarat, Jammu and Kashmir and Himachal Pradesh. In the pre-DDT era, there have been well-documented epidemics of kala-azar in Assam, West Bengal and Bihar; the last major outbreak was reported around 1944 from Assam.

At present, kala-azar is a serious problem in Bihar, West Bengal and eastern Uttar Pradesh. In 1996, Bihar and West Bengal had 33 and 10 affected districts, respectively. Sporadic cases as well as outbreaks have also been reported from other endemic and non-endemic areas. Patients from the hills of Uttar Pradesh have been increasingly reporting to Delhi and Chandigarh for treatment. However, the disease has remained under control in Assam and Tamil Nadu since the 1950s.

Bihar is the worst affected state with exacerbations every 15-20 years since the 1930s. A similar pattern of cyclical fluctuation was seen in Assam in the pre-DDT era, with outbreaks occurring approximately every 15 years. Due to the absence of an effective surveillance system in Bihar, only patchy data are available for outbreaks before 1977-78. However, Sanyal et al.[4] collected data between 1933-37 and 1956-60 from hospital and dispensary returns and found that 16 districts of Bihar had reported kala-azar during 1956-60. The different control programmes initiated in Bihar included:

1. Opening of kala-azar treatment centres,
2. Mass spraying of DDT under the National Malaria Control Programme (NMCP) and the National Malaria Eradication Programme (NMEP),
3. Kala-azar control programme with UNDP assistance, and
4. A central government-assisted kala-azar control programme in 1991-92.

The three previous control programmes had only a temporary effect on the occurrence of the disease in the state. The kala-azar epidemic in 1974 affected four districts (Vaishali, Muzaffarpur, Samastipur and Sitamarhi) and the north-central and north-eastern districts in 1992. In the inter-epidemic year of 1981, minimum cases were reported due to the initiation of a control programme in 1977-78. The number of cases reported per 100000 population was 69 during the 1991-92 epidemic and 36.8 in 1996. A remarkable decline was observed in the Vaishali district. Ten districts of the state (nine to the north and one to the south of the river Ganges) have been reporting more than 75% of the total cases for several years. In 1996, these 10 districts reported 80% of the total cases, with 33 districts accounting for all the cases. Due to administrative and socio-political reasons, several new districts were created in 1996 and this had led to difficulties in analysing the subsequent district-wise data. However, most of these districts are located north of the river Ganges, and a spot map shows an almost similar distribution.

The usual clinical features of kala-azar include general malaise, high fever, loss of weight, hepatosplenomegaly, anaemia, dark skin and extreme emaciation. However, extreme emaciation and pot belly are infrequently seen at present, as more and more cases report early for treatment. Hati et al.[5] reported an uncommon presentation of lymphadenopathy in the outbreak from Malda district of West Bengal. Sometimes, this may be the only clinical Age and sex distribution of kala-azar cases in different time periods manifestation. The clinical features of post kala-azar dermal leishmaniasis (PKDL) have remained almost the same over the years. The lesions are seen on the face, trunk, genitalia (scro-tum, penile shaft), extremities, tongue, palms and soles in de-creasing order of frequency and rarely on the areolae and in the larynx.

CONTROL EFFORTS-Efforts at controlling kala-azar in India have been largely influenced by the malaria control programme, except in the states of Bihar and West Bengal. After the success in kala-azar control through mass spraying of DDT in the 1950s, there has been no resurgence of the disease in several erstwhile endemic states including Assam. Thus, kala-azar control programmes are centred mainly around control activities in the states of Bihar.

Around 1937-20 kala-azar treatment centres were opened in Bihar resulting in a considerable reduction of cases. Mass spraying of

DDT undertaken by the NMCP and NMEP coupled with effective treatment through kala-azar clinics resulted in a virtual eradication of the disease in the 1960s. Subsequently, when the NMEP entered the maintenance phase in 1961, DDT spraying was withdrawn. This probably allowed the disease to resurge resulting in a severe epidemic in 1974. A reduction in the morbidity and mortality due to the disease was recorded following the kala-azar control programme initiated by the National Institute of Communicable Diseases (NICD) with UNDP assistance in four epidemic districts in 1977. Though this programme was withdrawn in 1979, the decline in mortality and morbidity continued till 1981-82. Until 1989-90, kala-azar control activities were undertaken by the state governments. During 1990-91, a central government-sponsored kala-azar control scheme was initiated for the endemic states of Bihar and Other states.

Spraying of DDT has been the cornerstone of kala-azar control since the 1950s. Two rounds (February-March, May-June for Bihar) of DDT spraying were recommended. It has been shown that Phlebotomus argentipes, the vector of Indian kala-azar, reappears in 9 months after a one-time DDT spray of 1 g/m. Thus, the long gap between rounds of insecticide spraying in Bihar might have allowed the vector to rebuild its numbers. If the insecticide spray strategy as applied in Assam had been adopted for Bihar during 1991, it is possible that kala-azar would have ceased to be a public health problem in 1994. Localized intensive spraying around dwellings of known kala-azar cases taking the village as a unit, with early case detection and proper treatment could also be effective in controlling the disease. Prioritization of areas for control activities based on the endemicity level, distribution of PKDL cases, distribution and density of vector species, identification of the population at risk and high-risk groups should be used to identify areas for insecticide spraying.

DISCUSSION--azar has re-emerged from near eradication in the past. In the pre-DDT era, outbreaks of kala-azar had been occurring at almost regular intervals in Bihar. The repeated resurgence of the disease in Bihar is a commentary on the inefficacy of the control programmes that have been implemented to date. Fortunately, in India, the proven vector Phlebotomus argentipes is so far susceptible to DDT, though there are some reports of its developing resistance to the insecticide. Sodium antimony gluconate (SAG), the main drug used for treatment, is still efficacious.

In Bihar, there has been a considerable decline in the morbidity and mortality from kala-azar since the last outbreak in 1991-92. Since 1992, the kala-azar morbidity has declined by 67.3%. Yet 24665 cases were reported during 1996; 1.74 times more than the number in 1981. The corresponding decline in mortality was 72.9%. However, the total number of cases and deaths have increased 2-5 times. Two foci of kala-azar were introduced in West Bengal almost simultaneously. In one area, the number of cases has declined considerably compared to the other area where it is still on the increase. Whether this is due to a failure of control measures or due to some other factor needs to be ascertained.

A sizeable proportion of kala-azar cases in women and children in the 0-9 years age group are not reported. This is also true for PKDL, as these lesions cause no perceptible problem. In an endemic situation, persons in the younger age groups are more affected. Subclinical infection in kala-azar is up to 20%.48People who are now 30 years or older were likely to have remained uninfected in childhood and adoles-cence, as kala-azar was on the decline during the 1960s. This makes them susceptible even at a much later age. This might be the reason for a larger number of cases in the older age groups in the present outbreaks in Bihar and West Bengal.

The under-reporting of cases among women and young children may be due to various prevailing socio-cultural and eco-nomic reasons among the people of these areas, which make them reluctant to bring women and children to hospital. Similar observations have been reported from Colombia and Costa Rica. Thus, a kala-azar and PKDL survey should be undertaken to determine the extent of the current problem. The importance of detecting and treating patients with PKDL for effective control of kala-azar has been emphasized.

Lymphadenopathy is a common presenting feature of kala-azar in the Mediterranean region," where the vector/agent differs from the one in India. About 5% of kala-azar patients in Iran develop lymphadenopathy and, recently, Leishmania tropica has been isolated from lymph nodes during an outbreak. 59The reports of lymphadenopathy as a major presenting feature in India raise the possibility of a new vector or a variant of the disease. This urgently needs to be investigated. In areas where malaria and kala-azar are endemic, co-existent malaria and kala-azar may lead to difficulties in diagnosis and appropriate treatment. Nandy et al. indicated widespread co-existence of malaria

and kala-azar in Bihar." In the absence of good laboratory support, physicians resort to therapeutic trials in all suspected cases. This might lead to non-responsiveness and the development of resistance to conventional drugs.

Most of the current research is being directed towards the development of newer and more effective drugs against kala-azar. These include amphotericin B, co-trimoxazole with antitubercular drugs, verapamil, paramomycine, and gamma-interferon.

Clinical trials in India have reported encouraging results with amphotericin B and it has now been recommended by NMEP as a third-line drug. A number of plant extracts have been tried against leishmaniasis with some success in the laboratory; but are of little use clinically.

The complexity and variety of epidemiological settings for foci of leishmaniasis makes it difficult to develop universally adaptable control measures, except for a vaccine. Phase ITI trials with a first-generation vaccine (killed Leishmania organism mixed with a low concentration of BCG as an adjuvant) produced encouraging results. A non-human primate model has been developed to evaluate various vaccines/drugs for leishmaniasis caused by Leishmania donovani.

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