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# Distribution of *Visceral leishmaniasis* in different age groups and sex category

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**Abstract-** *Leishmaniasis* is a prevalent protozoan infection in many parts of the tropical and subtropical world, causing a wide spectrum of human disease ranging from the life threatening Kala azar to the disfiguring mucosal and cutaneous forms of the disease. Kala azar is a severe form of disease that is nearly always fatal in the majority of untreated cases and ranked only next to malaria among human protozoan diseases. The World Health Organization (WHO) is included Kala azar in the list of neglected tropical diseases, with among the poorest a major impact and continues to be a major problems and economic disparity across the world. However, despite the apparent study on localization of Kala azar in the endemic regions of Bihar, the role of distribution of Kala azar in different age groups and sex category has remains unexplored. Herein, we investigate to attempt the correlation of Kala azar between age and sex groups and their distribution in four districts of Bihar.

**Keywords :** ***Leishmaniasis,*** **Kala azar, protozoanm, Bihar**

## INTRODUCTION

Kala azar (*Visceral leishmaniasis*) is a neglected tropical disease (NTD) which can be fatal if left untreated. It is transmitted by the bite of a sand fly and is characterised by prolonged fever, enlarged spleen, substantial weight loss and progressive anemia. *Leishmania donovani*, causative organism of *Visceral leishmaniasis* is dimorphic, having an extracellular promastigote form in the sandfly vector that converts into an intracellular amastigote within the macrophage in the human host. *Leishmania*, a protozoan parasite belongs to the family of trypanosomatids and is responsible for a group of diseases whose symptoms range from mild cutaneous lesions to fatal visceral involvement. Today, the *leishmaniases* are endemic in 88 countries with an estimated 350 million people at risk. It has been estimated that 12 million people are affected by this group of diseases with around 1.5 to 2 million new cases occurring annually; and this number is rising[1]. In humans, the disease occurs in four forms; life threatening *Visceral leishmaniasis* (VL), commonly known as kala-azar; *Mucosal leishmaniasis* (MCL), self-healing cutaneous leishmaniasis (CL), and postkala-azar *Dermal leishmaniasis* (PKDL). Ninety per cent of those afflicted by VL live in five developing countries namely, India, Bangladesh, Nepal, Brazil and Sudan. Bihar is the epicentre of Kala azar in India, where 33 out of 38 districts

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are affected. The population at risk is nearly 35 million in approximately 11,500 villages spread over 429 provincial blocks.

The focal distribution of *leishmaniasis* transmission sites depend on microecological conditions that affect the population of vectors, the parasite, and the reservoir host. Environmental changes that can affect the incidence of *Visceral leishmaniasis* include urbanization, domestication of the transmission cycle, and the incursion of agricultural farms and settlements into forested areas. The parasite distribution is mainly affected by rainfall, atmospheric temperature, and humidity (climate-sensitive disease). Global warming and land degradation together are expected to affect the epidemiology of *leishmaniasis* by a number of mechanisms.[2]

*Visceral leishmaniasis* is one of the world's most neglected diseases, largely affecting the poorest people, mainly in developing countries.[3,4] Human and animal *Visceral leishmaniasis* is widely distributed worldwide, namely, intertropical zones of America, Africa, and temperate regions of South America, Southern Europe and Asia. Epidemics of *Visceral leishmaniasis*, in both the old and the new world, are often associated with migration and the introduction of nonimmune people into areas with existing endemic or enzootic transmission cycles. Seasonal labor movements may also spread the disease, with the return of migrants to nonendemic areas and living in houses constructed of grassy material, appears to increase risk for the disease.[3]

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For many years, pentavalent antimonials have been the recommended drug for VL. Pentavalent antimonials, meglumine antimoniate (Glucantime, Sanofi-Aventis), and sodium stibogluconate (Pentostan, Glaxo Smith Kline) have variable efficacies against VL and require injectable administration, that can be intravenous (IV), intramuscular (IM), or intralymphatic (IL). Due to side effects such as high cardiotoxicity, pancreatitis, and nephrotoxicity, patients should be hospitalized and monitored, as treatment may need to be suspended.[5, 6] Antimonials seemto have a broadmechanismof action.[7] Amphotericin B deoxycholate (Fungizone) is a systemic antifungal and a highly active antileishmanial. Due to the increasing resistance to antimonials, it is used as an alternative drug for VL. But it is highly toxic, requiring careful and slow IV administration. A combination therapy of miltefosine with amphotericin B or paromomycin is very efficient and could be helpful to treat antimony-resistant VL infections. Sitamaquine is the second oral drug in the development of *leishmaniasis* treatment[8].

Earlier, we have characterized Localization of kala-azar in the endemic region of Bihar and the relationship between Land use/land cover classes and their suitability for vector habitats in areas endemic for kala-azar at different spatial scales. Herein, we report the Distribution of Kala azar in different age groups and sex category in the endemic region of Bihar and showed their relationship.

## MATERIAL AND METHODS

The field study was made in the disease endemic villages in the district of Araria, Purnea, Kisanganj and Madhepura. Sample Size The study was conducted in a total of 200 villages (50 villages in each district). In each district 500 beneficiries were selected to carry out the study. Sampling and Data Collection

Questionnaires are measuring tools used as inexpensive way to gather data from a potentially large number of respondents. Often they are the only feasible way to reach a number of reviewers large enough to allow statistical analysis of the results.

## RESULTS

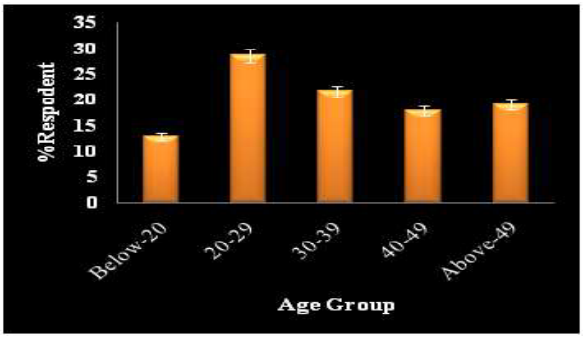
A total of 2000 respondent were interviewed through the pretested questionnaire and information was analysed.

**Age of Respondents**

Table 4 represents the distribution of the respondents according to their age group. It was observed that the largest age category of the respondents were highest from the age group of 20-29 years (28.55%) , above 49 years (18.9%) ,40-49 years (17.9%) followed by below 20 years(12.95%) .

**Distribution of Respondents according to age group**

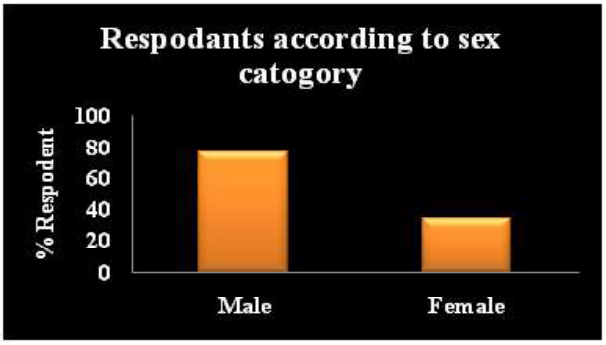
| Age (years) | Frequency | Percentage |
|---|---|---|
| Below – 20 | 259 | 12.95 |
| 20 – 29 | 571 | 28.55 |
| 30 – 39 | 434 | 21.7 |
| 40 – 49 | 358 | 17.9 |
| Above – 49 | 378 | 18.9 |
| **Total** | **2000** | **100.00** |




**Sex of Respondents**

Out of the 2000 respondents, 1530 (76.5%) were male, and 470 (37.5%) were female

| Sex Category | Frequency | Percentage |
|---|---|---|
| Male | 1530 | 76.5 |
| Female | 470 | 33.5 |
| **Total** | **2000** | |




*Visceral Leishmaniasis* (VL) is a parasitic disease that is lethal if not treated timely and mainly affects impoverished populations. The majority of VL patients attending the health services are male, and this is usually attributed to unequal access to health care for men and women in this sociocultural context. We analyzed two large datasets obtained the distribution by regular door-to-door screening for VL, in four districts in Bihar. By comparing the observed sex ratio in the health services records with those of the population surveillance records, we aimed to reach meaningful conclusions about the pathway through which male gender exerts its leverage for increasing VL risk: socio-cultural determinants blocking women from accessing care (nurture) or biological factors (nature) making men more vulnerable to VL. Because in the population-based age adjusted-data, male VL cases were significantly more frequent than female, our findings strongly suggest that in the Indian subcontinent, biological differences between men and women play a more critical role in the pathogenesis of VL than previously assumed, and the observed male predominance in VL cases in health services cannot be explained by socio-cultural factors only. Moreover, data show that above the age of 14 years, males are seropositive more often than females and are at higher risk to develop VL disease.

## DISCUSSION

The present study was to study the scio-economic condition of the patients of kala azar through questionnaire. The results revealed that the the respondents of age group of 20-29 years were more active and responded more followed by the age group of 30-39, above 49 years and 40-49 years. The male was more active than female may be due to easily accessible. It can be observed here that the male respondents almost doubled the female respondents. This might not be unconnected with the fact that males are usually more accessible than female counterparts.

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