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*Original Research Article*

# A Story of Controlled Escalation of HIV in Rural Population of Srikakulam

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## ABSTRACT

Over the past few years of the decade, HIV prevalence in India is on declining trend with less than 1% in ANC clinical attends and Srikakulam district has recorded a prevalence of 0.63%in ANC clinical attends and is at par with national statistics. This decline is due to nation's effort to control the infection by a more decentralized effort through ICTC testing and scaling ART services. This was a retrospective cohort study extending from Jan 2008 to Dec 2014 (7 years), to analyze the new infections and its rate and coverage area in Srikakulam district. In the study period for 7 years, we identified that from total of 1814 revenue villages and towns of Srikakulam, 1010 were infected with HIV by 2014. As on 2008, 462 villages were infected and during next 7 years, 548 villages were newly infected at 78 villages per year for 6 years in study period. The number of registered PLHIV in 2008 has come down from 1780 to 1117 in 2014. Overall, there is decline in HIV infection at par with national level but there is considerable expansion of disease in the district by infecting new villages rapidly as new infection increased from 26 villages in 2008 to 40 villages in 2014 for every 100 cases annually. As a point of concern, the expansion is so fast that it may lead to sudden increase in new cases in future and can hamper national program and need urgent intervention to control the spread of the infection.

***Key words:*** Distribution of HIV/AIDS, expansion of HIV, Threat to national program, HIV/AIDS.

## INTRODUCTION

At the end of March 2015, an estimated 36.9 million people were living with the human immunodeficiency virus (HIV) worldwide and 15 million were receiving life-saving antiretroviral treatment (ART) worldwide. [1] Despite scaling up ART in low- and middle-income countries, an estimated 41% coverage of those in need of ART. Universal access to treatment (defined as 80% or greater coverage) is thus still to be achieved in almost all parts of the world. [1]

In India, the total number of people living with HIV/AIDS (PLHIV) was estimated at 2,100,000 in 2012. [2] In recent years, the country has put considerable efforts in expanding HIV-testing sites, and about 200,000 new HIV-positive individuals are diagnosed each year. [2] The HIV prevalence observed among ANC clinic attendees is considered as a proxy for HIV prevalence in the general population, and during 2012-13, it was 0.35% (90% CI: 0.33-0.37). [3] Through rigorous efforts by NACO to reduce HIV infections, prevalence rate in

general population has come down from 0.33% in 2007 to 0.26% in 2012-13 [3] but still there are an emerging pockets of infections in the low prevalence states [4] contributing to disease burden in the country.

In the State of Andhra Pradesh in south India, 4,19,180 cases were registered and are 20% disease burden of the country. [4] HIV Prevalence higher than the national average was recorded in the state of Andhra Pradesh (0.59%), against 0.26% of national average. [3] The ANC attendees considered as proxy to prevalence, has recorded at 0.26% against nations average of 0.35 %, [3] which indicates a reliable declining trend of infection in AP inspite of increase of prevalence in general population. Along with other districts, there are an emerging pockets of infections in the Srikakulam contributing to disease burden in the state.

In the Srikakulam District of AP, we thus determined to have a look at the pattern of distribution of HIV infection in the district, along with identification of pockets that are causing new infection every year and to co- relate to the data with nation.

## MATERIALS AND METHODS

**Study design:** This was a Retrospective Cohort study involving a review of records routinely maintained under the National AIDS Control Programme (NACP).

**Study setting, sites and study population:** Srikakulam district with a population of 2.71 million is one of the smallest districts in state of Andhra Pradesh of India and is considered to have a relatively advanced HIV epidemic. [5] In 2009, the district had an HIV prevalence of <0.50%. [6] There are 17 public HIV-testing sites (16 are standalone, while 1mobile testing centre) and 1 ART centre with 3 Link ARTC+ and 6 LACs. All HIV-positive persons diagnosed at the HIV testing sites are referred to the nearest ART centre for further management and are expected to reach these ART centres on their own. ART centre, located at tertiary care medical college of the district, Rajiv Gandhi Institute of medical sciences, far from the point of HIV diagnosis; distances are in the range of 5-120 km, and they are often not well connected by public transport. Patients most often have to spend a whole day for each visit to the ART centre.

This study was conducted at ARTC, RIMS, Srikakulam from January 2008 to December 2014, across the district on PLHIV who are registered for care at ARTC. The registered PLHIV represents the actual disease burden of the district, and Srikakulam district has overall successful referral rate at 92 %. The study was done considering the address of the registered PLHIV between Jan 2008 to Dec 2014 and the address is updated with codes issued to villages by Govt. of India. [5] The revenue village codes issued in 2011 was used to analyze the distribution of PLHIV in the district and to identify the new pockets villages being infected in the district.

***Data and statistical analysis:*** The sources of data were HIV-testing records and ART centre records (pre-ART registers, ART enrolment registers and patient treatment cards). The total registered patient's records were reviewed for the correctness of address by checking with available ID proofs at ARTC.

## RESULTS

A total of 10373 PLHIV were registered from Jan 2008 to Dec 2014 at ARTC, RIMS, Srikakulam, of which 10204 PLHIV are from Srikakulam district of AP (total of 1814 revenue villages and towns covering total of 4013 habitations) and other 169 PLHIV are from other districts and states of India.

Of all PLHIV registered in the district- 10204 for a period of 7 years (Table 1), 2009 marks with highest percent of registrations with 19.36% and there is

decline in registrations to 10.95% in 2014 and there is no major difference in infected villages in the study period. The infected villages were ranging from 28.94% to 23.10% of total villages with average of 25.12% per year, but considering the total number of villages infected for 100 cases, there is alarming increase from 26 villages in 2008 to 40 villages in 2014 and this increase is continuous over the study period.

The most important finding in the study was, the villages that are frequently involved are contributing to majority of infection in the district. Over the period of 7 years [table2], there are 89 villages that are infecting every year continuously and these 89 villages have infected 4992 cases causing 48.92% of total infection in the district, while 249 villages causing 339 new infections at 3.28% .

**TABLE 1**

| YEAR | TOTAL REG | total VILLAGES | % registrations for year | %villages for year | no of villages for 100 cases |
|---|---|---|---|---|---|
| 2008 | 1780 | 462 | 17.44 | 25.47 | 26 |
| 2009 | 1975 | 525 | 19.36 | 28.94 | 27 |
| 2010 | 1619 | 503 | 15.87 | 27.73 | 31 |
| 2011 | 1381 | 462 | 13.53 | 25.47 | 33 |
| 2012 | 1148 | 419 | 11.25 | 23.10 | 36 |
| 2013 | 1184 | 468 | 11.60 | 25.80 | 40 |
| 2014 | 1117 | 452 | 10.95 | 24.92 | 40 |
| Grand Total | 10204 | | 100.00 | | |

## DISCUSSION

This is one of the studies in India that assessed the cause and frequency of new cases distribution of HIV at district level. This study started with linking data from registered PLHIV at ARTC, RIMS, Srikakulam at par with census data and assigning census codes issued by Govt. of India to villages and towns in Srikakulam [5] and then consolidated for the period of study, i.e., 2008 to 2014 for 7 years to assess the majority of pockets causing HIV infection in the district. In the study, it showed there is continuous increase in new villages every year inspite of total decrease in infections in the district and the villages that are consistently causing infection over 7 years in the study period has caused over 48.92% of the disease burden in the district.

A key finding of this study is that, 89 villages in Srikakulam, i.e., 4.91 % of total villages of Srikakulam was consistently infecting new cases every year and the rate of infection is at alarming pace and has total disease burden of 48.92% of cases in the study period. The notified path of new infection was the uncontrolled or under prevented areas in the district causing the disease burden. Every year 25.12 % of villages are infected and a point to note, 22.71% of villages are the cause of 83.73% of infections in the district and these 22.71% were the infected villages which were causing infection for more than 3 years. A recent study estimated a relatively high rate of patients in VF while among them an important proportion harboured wild-type viruses and this highlights a real need to reinforce treatment adherence [7] as PLHIV who are regular on HAART has reduced chances of transmitting virus to general population. [8]

Firstly, an encouraging finding of the study is there is consistently decline in new infections every year and this perfectly correlated with national statistics, [4] as per table 1, there were 17.44% of cases registered in 2008 and this declined to 10.95% in 2014. The decline in HIV cases registrations was correlated with increase in eligibility criteria for initiation on HAART [10] and regular on treatment patients has low risk of transmitting the virus. [8] Considering the success from the decline in the infection, it is better to reinforce the need for policy to treat all PLHIV irrespective of CD4 count.

Second, to the point of concern, the high proportion of cases are occurring in 89 villages and there is clear evidence to have a more decentralized approach and one more treatment facility in the high prevalent zone to reduce the transmission and effective treatment options and there is a clear need to decentralize ART further and bridge the geographical disconnection between HIV testing and care, as separate (disconnected) services are known to result in lower ART uptake [9] which further increase the cases in the zone and further résistance to virus.

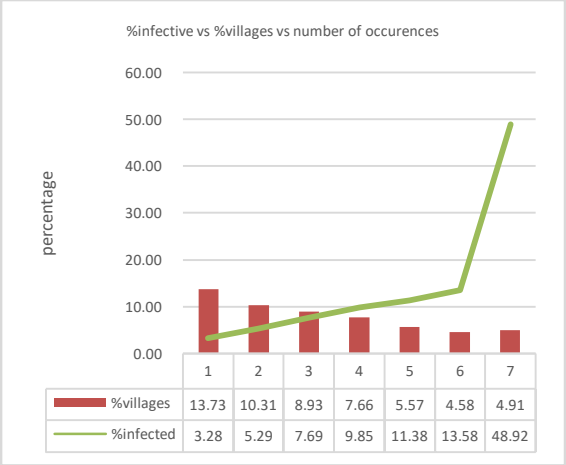


**TABLE 2**

| count | villages | cases | %villages | %infected |
|---|---|---|---|---|
| 1 | 249 | 335 | 13.73 | 3.28 |
| 2 | 187 | 540 | 10.31 | 5.29 |
| 3 | 162 | 785 | 8.93 | 7.69 |
| 4 | 139 | 1005 | 7.66 | 9.85 |
| 5 | 101 | 1161 | 5.57 | 11.38 |
| 6 | 83 | 1386 | 4.58 | 13.58 |
| 7 | 89 | 4992 | 4.91 | 48.92 |
| Grand Total | 1010 | 10204 | | |

Third, 21-40 age group has a total of 6919 cases causing 67.81% of infection and this group considered as skilled group and backbone to financial structure of India, were infected with the HIV and are hampering the income to the country. Srikakulam, being remote and hilly area, and majority of people survive by fishing and migration to other cities as construction labor, and majority of people live in villages, it is an utmost important to preserve our villages from deadly virus and there is every need to have an escalation of services with more decentralized manner to control the infection and to increase livelihood of the villagers.

The strengths of this study are that patients were rigorously counselled on drug use ranging from 6 months to more than 6 years, as the group selected for the study has a HAART initiation date as long as 12/05/2007 and latest date as 31/12/2014 and these regular on treatment PLHIV has reduced risk of transmission. This confirms that the new infections were probably due to hidden sources or uncontrolled/ irregular treated cases and due to migrated workers. We tried to explore reasons for miss through telephone calls and outreach visits and the data come from routine clinic to reduce miss cases that likely involved in transmission, and it is likely to reflect the on-the-ground reality. We also adhered to the guidelines for reporting of observational studies [11] and ethics. [12] Limitations include the fact that roughly 1.56% of patients who were registered are not from the district.

## CONCLUSION

In Srikakulam, a small district of Andhra Pradesh, state of India, 48.92% of all registered cases were from 89 villages in the district, and villages causing infection for more than 3 years were from 22.71% of villages were the cause of 83.73% of infections in the district and at an average 25.12% of villages are infected every year. The alarming situation is number of villages causing infection for 100 patients in the district has increased from 26 villages in 2008 to 40 villages in 2014, reflecting the aggressive spread of infection that can cause sudden increase in HIV infections in future and hamper the national program and requires a relook into prevention aspect of the national program.

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