

Editorial

The evolving Indian AIDS epidemic: Hope & challenges of the fourth decade

When HIV was first identified in Tamil Nadu among female sex workers in 1986, some clinicians and public health officials were concerned that the epidemic could spread rapidly and become an uncontrolled pandemic. The conditions that usually potentiate HIV spread existed in India, including a large mobile population, urbanized transactional sex, income disparities, and gender inequalities. And, indeed, the epidemic has grown in India, with more than 2.5 million people currently living with the virus, a larger national epidemic than all but South Africa and Nigeria. Yet, the epidemic does not appear to have become generalized, the way that it has in several Sub Saharan countries. Instead, HIV appears to be concentrated among individuals who engage in specific high risk activities, including sex work, male homosexual behaviour, and injecting drug use. This does not mean that others are immune, that individuals with lower risk profiles, like spouses and offspring, have not been affected by the epidemic, but the overall Indian general population prevalence is under 0.2 per cent, less than that in the United States and Russia. But because India has such a large population, the absolute size of the epidemic continues to pose challenges for long term successful response. Nonetheless, initiatives by the National AIDS Control Organization, with partners like Avahan, supported by the Bill and Melinda Gates Foundation, in conjunction with a robust response by clinicians and community-based organizations, seem to have stemmed the tide, for the time being. The cautious note reflects the recognition that until a safe and effective vaccine is available, and/or a cure can remove the virus from infected hosts, success in controlling the epidemic will require continued political will and substantial resources.

Now, more than 30 years since the first reports of the first cases of AIDS in the United States, India and

the global community have evidence that currently available tools can arrest, if not end, the epidemic. This past year, HPTN 052 demonstrated that earlier initiation of highly active antiretroviral therapy (HAART) at CD4 counts about 350 cells/mm³ in HIV-infected patients decreased their likelihood of transmitting the virus to partners by 96 per cent¹. This important finding was buttressed by several trials that found that peri-exposure use of antiretrovirals topically or orally could decrease the likelihood of HIV acquisition by at risk persons^{2,3}. These findings are exciting, supporting the *mantra* that treatment is prevention, but also raise questions, concerns and challenges. In order to decide who should begin early treatment, or be a candidate for prophylactic medication, individuals need to present for voluntary counselling and testing, or be screened by a knowledgeable health care provider. If all HIV-infected and at risk persons are identified, they then need to receive medication and be clinically monitored, which entails substantial costs. Although the national scale up efforts have been impressive, with more than half a million HIV-infected Indians receiving HAART in the public sector, substantial unmet need remains, which will grow if national guidelines are expanded to incorporate the findings from HPTN 052 and the recent prophylaxis studies.

In this time of unprecedented opportunity and challenge, the current issue of the Indian Journal of Medical Research has assembled a broad array of substantive papers, which together can be construed as the most thorough contemporary academic review of the science of AIDS research in India. The first article by Dr Mehra and colleagues at All India Institute of Medical Sciences (AIIMS), New Delhi⁴ describes the current understanding of HIV immunopathogenesis, followed by discussion by Dr Banerjee and colleagues⁵ at National Institute of Immunology (NII), New Delhi,

of the diverse genetic profiles of strains circulating in India, and implications for vaccine development. Dr Parekh and colleagues⁶ in their article discuss about HIV testing in developing countries. The next series of papers discuss the current principles of optimal clinical care for HIV-infected Indians, led by Dr Kumarasamy and colleagues of YRGCARE, Chennai⁷, discussing considerations regarding the management of antiretroviral therapy. Dr Vajpayee and colleagues from AIIMS⁸ discuss current laboratory testing principles, while Dr Balakrishnan and colleagues at YRGCARE⁹ discuss newer low cost diagnostic technologies, which may make laboratory monitoring more cost-effective in the future. Dr Sahay and colleagues from National AIDS Research Institute (NARI), Pune¹⁰ discuss the current state-of-the-art regarding optimizing medication adherence, since none of the epidemic control strategies will work if individuals will not take their medications. The next two papers discuss issues related to the most common co-morbid condition associated with HIV, TB co-infection [as reviewed by Dr Swaminathan and group from National Institute of Research in Tuberculosis (NIRT), Chennai¹¹] and the immune reconstitution syndrome that often follows the initiation of HAART in co-infected patients (discussed by Dr Sharma and colleagues at AIIMS¹²). Two other common problems that HIV-infected patients encounter are subsequently discussed, parasitic infections by Dr Nissapatorn of the University of Malaysia¹³ and atherogenic complications by Dr Barbero and colleagues of La Sapienza University in Italy¹⁴.

The next section of this special issue focuses on challenges for HIV prevention in India, starting with a focus on specific populations: serodiscordant couples (discussed by Dr Solomon and colleagues of YRGCARE¹⁵), children (reviewed by Dr Mothi and colleagues from Asha Kirana¹⁶), and men who have sex with men (discussed by Dr Thomas and colleagues from the NIRT¹⁷). The next two papers, by Dr Ramjee from South Africa¹⁸ and Dr Gupta and colleagues from NII¹⁹, discuss the promise of topical microbicides in HIV prevention. These papers point to the challenges for the future of epidemic control in India: to assimilate the lessons of previous efforts, to develop programmes that are culturally appropriate for the Indian context, and to maintain the political will that mobilises the resources needed to optimize testing, serostatus knowledge, earlier HAART initiation, engagement in care, and the full array of preventive services. Each of these components will

need to be included as part of a comprehensive and successful strategy to control the AIDS epidemic in India. The papers in this issue of IJMR reflect the remarkable progress in AIDS research, clinical care, and prevention over recent years, but implicitly ask the question of whether these findings can be translated into actions that will have a meaningful and longstanding impact on this epidemic.

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References

1. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, *et al.* Prevention of HIV-1 infection with Early Antiretroviral Therapy. *N Engl J Med* 2011; 365 : 493-505.
2. Abdool Karim Q, Abdool Karim SS, Frohlich JA, Grobler AC, Baxter C, Mansoor LE, *et al.*, for the CAPRISA 004 Trial Group. Effectiveness and safety of tenofovir gel, an antiretroviral microbicide, for the prevention of HIV infection in women. *Science* 2010; 329 : 1168-74.
3. Grant RM, Lama JR, Anderson PL, McMahan V, Liv AY, Vargas L, *et al.*, for the iPrEx study team. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010; 363 : 2587-99.
4. Sharma S, Kaur G, Mehra N. Genetic correlates influencing immunopathogenesis of HIV infection. *Indian J Med Res* 2011; 134 : 749-68.
5. Neogi U, Sood V, Ronsard L, Singh J, Lata S, Ramachandran VG, *et al.* Genetic architecture of HIV-1 genes circulating in north India & their functional implications. *Indian J Med Res* 2011; 134 : 769-78.
6. Alemnji G, Nkengasong JN, Parekh BS. HIV testing in developing countries: What is required? *Indian J Med Res* 2011; 134 : 779-86.
7. Kumarasamy N, Patel A, Pujari S. Antiretroviral therapy in Indian setting: When & that to start with, when & what to switch to? *Indian J Med Res* 2011; 134 : 787-800.
8. Vajpayee M, Mohan T. Current practices in laboratory monitoring of HIV infection. *Indian J Med Res* 2011; 134 : 801-22.
9. Balakrishnan P, Iqbal HS, Shanmugham S, Mohanakrishnan J, Solomon SS, Mayer KH, *et al.* Low-cost assays for monitoring HIV infected individuals in resource-limited settings. *Indian J Med Res* 2011; 134 : 823-34.

10. Sahay S, Reddy KS, Dhayarkar S. Optimizing adherence to antiretroviral therapy. *Indian J Med Res* 2011; *134* : 835-49.
11. Padmapriyadarsini C, Narendran G, Swaminathan S. Diagnosis & treatment of tuberculosis in HIV-infected patients. *Indian J Med Res* 2011; *134* : 850-65.
12. Sharma SK, Soneja M. HIV & immune reconstitution inflammatory syndrome (IRIS). *Indian J Med Res* 2011; *134* : 866-77.
13. Nissapatorn V, Sawangjaroen N. Parasitic infections in HIV infected individuals: Diagnostic & therapeutic challenges. *Indian J Med Res* 2011; *134* : 878-97.
14. Barbaro G, Barbarini G. Human immunodeficiency virus & cardiovascular risk. *Indian J Med Res* 2011; *134* : 898-903.
15. Solomon SS, Solomon S. HIV serodiscordant relationships in India: Translating science to practice. *Indian J Med Res* 2011; *134* : 904-11.
16. Mothi SN, Karpagam S, Swamy VHT, Mamatha ML, Sarvode SM. Paediatric HIV-trends & challenges. *Indian J Med Res* 2011; *134* : 912-9.
17. Thomas B, Mimiaga MJ, Kumar S, Swaminathan S, Safren SA, Mayer KH. HIV in Indian MSM: Reasons for a concentrated epidemic & strategies for prevention. *Indian J Med Res* 2011; *134* : 920-9.
18. Ramjee G. Microbicides for HIV prevention. *Indian J Med Res* 2011; *134* : 930-8.
19. Nutan, Gupta SK. Microbicides: a new hope for HIV prevention. *Indian J Med Res* 2011; *134* : 939-49.