

Review Article

HIV/AIDS in India: Revisiting Social and Scientific Issues to Tackle the Spread of the Disease

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In 1986, the first case of HIV in India was diagnosed in a commercial sex worker. Twenty two years since then, India has the third largest number of HIV infected people in the world. This review focuses on the social and scientific factors that need to be considered to fight against the HIV/AIDS epidemic in India.

Key Words: HIV/AIDS; India; Clade-c

Introduction

India's national response to HIV began in 1992, six years after the first case of HIV was detected in Chennai. Since then, an exponential number of new infections across all sections of the community has been reported. Although, the current national estimated adult prevalence seems low at less than 0.36% of the total population, it still means that 2.5 million Indians are HIV positive (www.nacoonline.org). In terms of absolute disease burden, India ranks third after South Africa and Nigeria (www.unaids.org).

Social changes are creating complex obstacles for our response to HIV in India. It has been demonstrated that acceleration of socially-driven epidemic outbreaks of infectious diseases is effecting massive political, ecological and social changes [1]. In turn this leads to large-scale disruption of existing social networks especially sexual (and injection) mixing patterns. Promiscuous sexual and injection behaviors facilitate HIV transmission; these will play an important role in generating new HIV outbreaks in Indians as an outcome of increasing globalization.

Unlike developed countries, we do not have enough resources such as equipped scientific laboratories and medical personnel to deal with AIDS epidemic. Additionally, we lack storage capacity to store blood and have limited diagnostic capabilities in smaller towns and villages to test for HIV/AIDS. Importantly, social problems like cultural taboos against discussion of sexual practices, logistic issues like poor coordination between local health authorities/doctors and their communities, and finally epidemiologic concerns such as widespread

poverty and malnutrition compound the challenges we face.

In this review, we will discuss the social, economic, political, scientific aspects that need to be considered for effective control of the HIV/AIDS pandemic in India.

Social Issues: Lessons from the Studies

HIV is a "disease of the society" and the government should recognize its social implications, independent of the scientific ones. Understanding the social implications of this disease will enable us to take appropriate measures to prevent further spread of HIV. Until a cure or vaccine is in sight, awareness and prevention are the mainstays of control [2].

Based on current knowledge, heterosexual transmission is the most common route of transmission in India. Low literacy communities have a higher incidence of infection and peer education models have been adopted in such areas. The pilot studies conducted in low literacy areas demonstrate the utility of using established networks to train community popular opinion leaders, women leaders and barbers to disseminate information in these populations [3, 4] Studying the community perception towards HIV testing is a useful tool to design high yield awareness and education models [5]. The voluntary counseling and testing centers (VCTC) serve as accessible centers to correct prevalent misconceptions about sex in a country, where talk on this topic is not openly encouraged. Studying gender based differences in knowledge, attitude and practice of disease and prevention is vital to target the vulnerable groups [6].

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Studies from Benjamin *et al.*, [7] have shown that women are less prone to practice high risk behaviour but know less about HIV than their male counterparts. In concordance with Benjamin's findings, Pramanik *et al.*, [8] showed that female adolescents had less knowledge than males but these male adolescents reported more high risk behavior. However school based teenage education programs show higher success rates in girls compared to boys [9]. This suggests that educational interventions could bridge the gap in lack of awareness for girls rather efficiently. Additionally recruiting groups with higher awareness to educate peers has shown dramatic success [9-11]. In the backdrop of the taboos associated with discussing sex freely, these findings strongly advocate early sex education in school to reap long term benefits for prevention of STDs. Although some may argue that early sex education may promote high risk behavior as a result of learning ways to protect against unwanted pregnancies and STDs, this cannot be touted as a reason to hold back information [12].

The fight against HIV/AIDS will be successful only if individuals and the government act responsibly. Another study which supported the above-mentioned findings showed poor risk perception in the working women cohort; albeit high risk behavior was less commonly practiced by this group [13]. The success of educational interventions has been documented in most studies which show a decline in the incidence of the HIV as a result of rising condom usage, an outcome of increased awareness [14]. In contrast, reports from some districts in Goa reveal that high levels of awareness do not translate to implementation of safe sexual practices [15]. Such findings emphasize the need of customizing HIV/AIDS awareness programs to communities, bearing in mind that India's diversity preempts building a common model for overcoming social hurdles [16, 17].

Putting a face to this epidemic would be an impressive message to reach out to Indians, most of whom live in the false security that "this disease does not concern me, I can never contract it". People living with HIV/AIDS (PLHA) would therefore be a useful resource to engage in community programs. A study by Paxton *et al.*, [18] revealed that the major barrier to the involvement of HIV positive individuals in response to HIV/AIDS is AIDS related stigma. Also most of them lack advocacy skills to take on roles as educators, counselors and motivators – we need to focus our efforts towards empowering them in the larger interest of the community. Institutional discrimination of PLHA poses another serious barrier which should be addressed urgently [19]. Following international initiatives, we can incentivize HIV+ patients' participation by financial reimbursement or indirect benefits such as free health

care. This would encourage HIV+ patients to involve themselves in prevention programs. These findings identify key areas to concentrate efforts for increased efficacy of prevention programs [20].

Most of the reports on HIV in India are from studies conducted in South India. A study reports an encouraging decline in the HIV incidence in South India [21]. However, the glaring dearth of studies from UP, Bihar points a significant gap in our understanding. Mass migration of men from these states to metropolitan cities in search of jobs leads to high risk behavior. They transmit the infection to their wives in these villages and inadequate infrastructure precludes screening in this vulnerable population. Legitimization of pre-marital HIV screening and offering these services as marriage registration offices would be a sound idea to protect these women. A study by Radhakrishna *et al.*, [22] has shown high infection rates in housewives in Andhra Pradesh. Alarming, most HIV positive women are in good health with no complaints when they present for antenatal care. Relying on clinical acumen alone to refer for testing will miss a vast majority of HIV+ pregnant women who are asymptomatic. This underscores the need to build and strengthen nationwide HIV testing capabilities for all pregnant women. This brings us to the question of acceptance for testing and true informed consent. Sashy *et al.*, [23] examined pregnant women's understanding of HIV/AIDS education and counseling. By using visual aids, these women reported improvement in overall comprehension. Such simple aids would translate into better acceptance rates for testing. Scientifically conducted studies which assess the attitude of test takers will strategically create favorable environments for efficient testing and wider outreach [24].

Two high risk groups which have been largely ignored but do exist are: homosexuals and women drug users. Homosexual intercourse is associated with increased trauma and subsequently a higher rate of HIV transmission [25]. Homosexual behaviour has been stigmatized. In addition criminalization of homosexuals in India makes it difficult to identify this group [26]. Surveillance among Men Who Have Sex with Men (MSM) has revealed new pockets of epidemic are emerging (www.nacoonline.org), this prevents us from understanding the dynamics of HIV transmission in these high risk groups. The government needs to institute culturally appropriate, multi level interventions developed with community stakeholders to protect and care for these emerging groups. Another high risk group which has received little attention is women drug users. Inadequate mental health services and lack of diverse treatment options for these women are the current gaps in managing this cohort [28].

Economic and Political Issues: Understanding the Parameters to Estimate the Financial Burdens on Society and Family

The economic consequences of a chronic illness like HIV which affect the productive strata of society is crippling more so in India where disability allowances and free treatment are not widely available. This effect is disproportionately more in the low-income households and propagates the vicious cycle of poverty and illness that exacerbate each other. The estimation of national resources and needs should be a crucial factor to formulate new policies for containment of this epidemic. Preliminary studies (reviewed in [14, 29-31] review the financial consequences but detailed studies are required to determine the financial burden on families and the government to propose economically feasible models [32]. Parameters such as the number of new infections prevented and reduction in the potential years of life lost (PYLL) will guide decision makers to adequately allocate these resources. Recognizing innovative models like the new “geometry of care”[33] to understand, build, revise and maintain the organizational infrastructure for effective control of HIV/AIDS will empower community settings to be self-reliant to combat this health challenge [34].

Treatment costs are an emerging concern as the government launches free highly active antiretroviral therapy (HAART). However free HAART is available in select centers and requires only stringent criteria to be met before initiation of therapy compel HIV+ patients to turn to non governmental organizations (NGOs) for health care. A seminal study by John KR *et al.*, [35] showed that providing HAART to PLHA in the NGO setting is economically justified. Understanding such long term benefits over short term expenditures will go a long way in improving the quality of life at a lower cost. Although the generic combinations of the first line drugs are available, only brand formulations of second line drugs are on market. Foresight is warranted by the health care officials to plan the introduction of second line drugs soon by predicting first line drug failures and investigating ways to reduce prices for second line drugs [36]. Additionally, new patent laws in India may restrict the supply of generic first line drugs and have dramatic consequences on the free HAART rollout [37]. One must envisage these problems and also be cognizant of the underlying ethical issues to allow for smooth and continuous delivery of HAART for HIV infected patients [38]. Urging the pharmaceutical companies and business houses to act on the corporate social responsibilities will facilitate distribution of HAART, increasing HIV awareness and improving social acceptance of this disease [39].

Scientific Lessons: Medical and Basic Sciences Need to Collaborate

Human immunodeficiency virus type 1 clade C (HIV-C) is the most common subtype circulating in the world and is the predominant strain in India. HIV-C is associated with rapid disease progression and is distinctive for its pathogenesis [40-59]. Most anti-retroviral drugs in the market are tested against the clade B, which is the most common circulating subtype in the developed world. This results in slightly less efficacy against the Indian strain of the virus [60-62]. However international travel has abrogated such region specific strain differences with emerging circulating forms [63]. Research groups have realized the need to tailor drugs and vaccines inclusive for clades. This poses a unique opportunity for India, which has the most widely circulating strain in the world. It is encouraging to see the tremendous progress made by Indian scientists to understand the virologic and immunologic aspects of the circulating subtypes of HIV in India, the immune responses generated by patients, and their participation in trials with indigenous microbiocides and vaccine initiatives [51-53, 56, 58, 64-73]. Using dried blood spots, samples can be easily obtained from field studies and transported them to tertiary reference laboratories to build a strong repository for large scale studies [74-76] (www.retroconference.org/2008/PDFs/922.pdf) Indian scientists can collaborate with international agencies for studies on HIV pathogenesis and participate in designing new therapeutic modalities which will have equivalent efficacy in the Indian populations. A recent review laudably highlights India's readiness to participate in international vaccine trials [65, 67].

Countries like China have proven that on following good clinical practice guidelines rigorously, studies are equivalent to the Western counterparts [77]. Such studies are heartening when we look at the Western world for funding in bilateral initiatives. Their concern about ethical implementation and adherence to protocols is addressed when we demonstrate our capabilities to follow protocols. In turn, we rely on their current expertise to understand the pathogenesis of the strains endemic to India. Acknowledging the dual nature of benefits to the collaborators will seed new collaborations. Adopting a closed door policy will harm us in the long run as the circulating strain of the virus in our country (clade C) is known to behave differently from its counterparts circulating in the developed world [78, 79]. Participating in international trials will allow for vaccine/drug trials to test their efficacy in the strains endemic to India. It would be interesting to do a bibliometric analysis conducted in Nigeria to study the number of collaborations and their international presence in HIV

journals/ conferences [80]. Trending the country's initiative to contribute to the understanding of HIV will establish our presence and invite research groups to set up studies in concert with Indian scientists.

The role of private practitioners cannot be underscored enough in the Indian health care system. They represent a diverse group and are poorly regulated by the government. With no stringent guidelines for continuing medical education, it is not surprising to note that health care workers score poorly on knowledge, attitude and practice surveys. Policy makers should be made aware of the popularity of the traditional healers especially in rural settings and take steps to increase their participation in HIV programs [81]. Pallikadavath and Datye *et al.*, [82, 83] observed that there are no standard guidelines followed by private practitioners in the country and advise for a bottom up approach to policy development. The high presence of private practitioners in health care makes for a strong case to collaborate with them to enhance continuity of care for HIV positive patients. Rectifying this lacuna will permit evidence based and compassionate care to PLHA in health care settings [84, 85]. The success of the public private initiatives for tuberculosis is an exemplary model for working in tandem with public practitioners [86, 87].

Previous studies describe the pathogenesis of HIV and disease manifestations in the Indian population, which reflects on the viral properties of the circulating strain of HIV and characteristics of the infected population [41, 45, 50-52, 54-56, 68, 71, 73, 88-91]. These studies are pivotal in designing screening strategies for detecting and managing infected individuals. Correlating the epidemiological characteristics of infected patients like the younger age of female sex workers emphasizes the need for screening of cervical cancer in these susceptible populations [92]. These observations should serve as red flags to alert clinicians for HIV testing in the out patient setting.

Public Health

Studies have conclusively shown that public health in India is a poorly developed field and there is an urgent need to advance our knowledge in this area. The public health research output from India is grossly inadequate and requires more attention to evaluate the population level problems created by HIV [93, 94]. We cannot look at studies from other nations for our population as each community bears its own unique set of problems and challenges which is best understood through public health research done in that community setting. This bears special importance to successfully implement screening tests and institute management of HIV positive individuals. For instance, pilot studies integrating the TB services and VCTC in India have been encouraging

Tapping into well established ground networks like those for tuberculosis or STD clinics, which also enable identification of populations at increased risk of HIV [95], would enhance the existing services. But, it is important to train additional health care workers and expand these services to prevent collapse of the existing services on account of increased burden.

Conclusions and Recommendations

A multidisciplinary outlook adopting a team approach to integrate basic scientists, health care personnel, economists and social workers, will provide the best answer to curtail this health challenge. In India, we have to move from targeted awareness and successful interventions among high-risk groups to develop a strategy that is valid for the whole country, yet is tailored to local needs. Some of India's most effective programs, especially those run by NGOs, are small and cannot be readily scaled upwards. However, to acknowledge their presence in the local community and work with them will allow for greater efficacy of outreach programs

Research on social issues especially gender and disease stigma is critical to understand HIV/AIDS epidemic in the country, and require special emphasis from Indian researchers. We need to bring home lessons from biomedical researchers in developed countries, such as balancing two goals (social and scientific) while designing epidemiological studies. Inviting international collaborations would be a high yield venture in the right direction.

Sex education should be included in the high school curriculum to raise awareness among adolescents. Marriage registration offices should offer premarital testing. To avoid mother to child transmission (MTCT), antenatal screening should be made available nationwide. A national policy to validate these recommendations would be very helpful.

Democratic politics in India have complicated the fight against HIV/AIDS in the past because issues of sexual behavior and the marginalized populations, which figure so prominently in the epidemic, are not easy topics for public discussion. Yet, this picture is changing. There are signs that AIDS is becoming a political issue in India, at least in select areas. Although access to primary health care has not been a major campaign issue in Indian politics in the past, the HIV/ AIDS epidemic could change that, especially in areas that include seriously affected constituencies. It will be interesting to see how our politicians will rise to this challenge.

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