

Current Trends in HIV/AIDS

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Human Immunodeficiency Virus (HIV) infection is one of the relatively recent infections detected three decades back. It spread widely in a short span and became a public health priority in many countries. A multipronged approach is required for mitigating the impact of HIV as it affects different facets of life. HIV has also remained an important focus for research to the scientists belonging to diverse disciplines such as clinical, social and basic sciences.

Trends in HIV epidemic

The rapid spread of HIV has occurred in spite of having its restricted routes of transmission. The HIV epidemic was restricted initially to high risk populations like sex workers, Men having sex with men (MSM), and Intravenous Drug Users (IDUs) owing to its routes of transmission. But later it also spread to the general population through the bridge populations like clients of sex workers and bisexual males leading to its increased prevalence in general population that reached as high as 24-27% in some of the countries [1]. The HIV epidemic is declining in many countries with the number of new HIV infections decreasing from 3.2 million in 2001 to 2.5 million in 2011 [1]. However, the risk of entering the epidemic in second growth phase should always be kept in mind as the second growth phase of HIV has already been reported in some of the countries. Hence the intensified prevention efforts need to be continued along with measures to reduce HIV related stigma which acts as a major barrier for HIV infected patients impacting their access to HIV prevention and treatment programs. Fortunately, stigma has been found to be reduced considerably owing to the increased knowledge about HIV/AIDS through community awareness programmes [2].

Trends in HIV prevention methods

Prevention methods for HIV can be broadly classified as behavioural and biological methods. Behavioural prevention methods classically known as ABC of HIV prevention (Abstinence, behavioural changes and condom usage) still continue to be the mainstay of HIV prevention because of limitations

of the biological options. There has been immense research going on over years on biological options like vaccines, microbicide, male circumcision, pre and post exposure prophylaxis. Effective vaccine, if available, would have an impact on HIV eradication. However, HIV vaccine research has faced many setbacks with disappointing results of Vaxgen's phase III trials as well as by failure of Ad5 based STEP and HVTN 505 trials [3-5]. The results of RV144 vaccine trial that demonstrated modest efficacy of 31% have been encouraging for HIV vaccine research [6]. Microbicides trials and trials on pre-exposure prophylaxis have given conflicting results in clinical trials [7,8] and more research efforts need to be put in towards success of these strategies. As against this, male circumcision has been shown to decrease HIV acquisition [9] and needs to be advocated strongly as a HIV prevention method in spite of religious sensitivities associated with it. Treatment of HIV infected patients with anti-retrovirals also serve as one of the prevention strategies by decreasing secondary transmissions. The success of programmes for Prevention of Mother To Child Transmission (PMTCT) in decreasing vertical transmission in infants and of HPTN 052 study in decreasing transmission to the uninfected partners in discordant couple setting have highlighted the important usage of anti retroviral drugs as a prevention strategy [10].

Trends in tests for HIV diagnosis and monitoring

Against the limitations of prevention interventions, the treatment for HIV has evolved immensely making HIV as one of the very few viral infections against which effective treatment is available. For initiating Anti-Retroviral Treatment (ART) in timely manner, HIV diagnosis also needs to be done early. Tests for HIV diagnosis have evolved over the years from 1st to 4th generation ELISAs reducing window period to 18 days from 6 months in the initial periods. Rapid tests for HIV diagnosis are serving as the point of care tests requiring no specialized facility increasing coverage of the testing centers even at peripheral facilities. The battery of simple and accurate tests available today has further contributed to the success of mobilizing people to get tested and access care. However, more efforts are required for scaling up of the testing to bring more patients under treatment cover. Home-based HIV testing and counselling (HBHTC) would also help in overcoming some of

the barriers and provide testing to individuals who might not otherwise seek services. The point of care tests are also available for CD4 count estimation and efforts for developing such tests for determination of viral load are ongoing. The point of care tests for monitoring of HIV infection and treatment would help in decentralization of treatment facilities making the treatment more accessible to harder-to-reach populations and would also reduce loss to follow up of patients before initiation of treatment.

Trends in HIV management

Treatment of HIV has now become simpler and cheaper because of availability of fixed dose combinations and low cost generic drugs. There are many classes of antiretroviral drugs with many new additions coming up targeting different phases of HIV life cycles for managing and preventing emergence of drug resistant mutations. WHO guidelines for ART initiation have also changed recently based on the evidence of benefits of early ART initiation in terms of providing healthier life to HIV infected patients. Early initiation decreases risk of development of opportunistic infections as the immune system is not allowed to be compromised, thus causing a paradigm shift of HIV treatment from Immune restoration to immune preservation. For this reason, 'Test and treat strategy' has been adopted by many clinicians and will become a norm for HIV treatment very soon. Guidelines for ART in pediatric age group have also been revised recently [11].

Because of success of ART in achieving viral suppression, life expectancy of these patients has increased and occurrence of AIDS defining illnesses has been reduced substantially. However, because of increased life span and premature ageing caused by antiretroviral drugs, many age-related issues are emerging in this population leading to a phenomenon of "Greying of AIDS". HIV infected individuals on ART are shown to be at elevated risk for an array of "non AIDS" conditions like liver disease, cardiovascular disease, kidney impairment, non-AIDS cancers, osteoporosis, neurocognitive decline, etc [12]. Clinical management of these conditions in older patients will have to be kept in focus in upcoming years. Synthetic peptides and Env mimic peptide drugs are upcoming strategies with low systemic toxicities being evaluated as HIV entry inhibitors for treatment and probable candidates for HIV vaccines [13].

Trends in HIV cure research

One of the major limitations of ART is its inability to act on viral reservoirs requiring adherence to lifelong treatment. HIV cure has been currently the main focus area in HIV research to avoid toxicities and cost of lifelong ART. Strategies attempted so far for HIV cure consist of purging of HIV reservoir by activation in presence of anti-HIV drugs, bone marrow transplantation and gene therapy [14]. Initiating ART early during acute phase of the infection can also help to achieve functional cure by limiting development of size of the viral reservoir. Recently reported Mississippi case and a report on Visconti's cohort have highlighted the benefits of the early treatment. Berlin and Boston cases reporting HIV cure in cancer patients after bone

marrow transplantation along with the Mississippi case have helped in raising hopes for the HIV cure.

Conclusion

Behavioural HIV prevention methods along with the effective ART have helped in stabilizing HIV epidemic in many countries. However, they need to be sustained and reinforced with biological prevention methods to halt the HIV epidemic further. With the availability of effective anti-retroviral drugs, it has been possible to convert HIV infection as a chronic treatable disease by increasing life span as well as quality of life of HIV infected patients. However, efforts for developing effective vaccines or strategies for HIV cure need to be pursued relentlessly for achieving HIV eradication.

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