Challenges in the Management of HIV Disease in India

Suniti Solomon, MD
Director
YRG Center For AIDS Research & Education
Challenges

1. What is the true burden of HIV disease in India and how is it distributed?
2. Who are the emerging risk groups?
3. What are the various challenges that we face in prevention?
4. What are the major challenges we face in the treatment of HIV in India?
**Press release**

**2.5 million people in India living with HIV, according to new estimates**

Improved data from more sources gives better understanding of AIDS epidemic in India

**New Delhi, 06 July 2007** – The new 2006 estimates released today by the National AIDS Control Organization (NACO), supported by UNAIDS and WHO, indicate that national adult HIV prevalence in India is approximately 0.66%, which corresponds to an estimated 2.5 million to 3.1 million people living with HIV in the country. These estimates are more accurate than those of previous years, as they are based on an expanded surveillance system and a revised and enhanced methodology.

As part of its continuing effort to know its epidemic better, the Indian Government has greatly expanded and improved its surveillance system in recent years and increased the population groups covered. In 2006, the government created 400 new sentinel surveillance sites and facilitated National Family Health Survey-3, which is a population based survey.

Launching the third phase of the National Programme, Dr. Anbumani Ramadoss, Union Minister for Health and Family Welfare said, “Revision of estimates based on more data and improved methodology marks a significant improvement in systems and capabilities to monitor the spread of HIV, a sign of the progress we have made in understanding the epidemic better. This is welcome progress. Unfortunately, the new figures still point towards a serious epidemic with the potential to trigger off the prevention efforts identified in the NACP III are not scaled up rapidly and implemented in the desired manner. We must remember that India has nearly 30 lakhs people living with HIV. These are people facing stigma, discrimination and irrational prejudice everyday of their lives and need all our support and understanding.” The Minister called upon his colleagues in the medical profession and civil society organizations to fight stigma and discrimination.

Resulting from a more robust and enhanced methodology, the revised estimates will be used to improve planning for prevention, care and treatment efforts. “While it is good news that the total number of HIV infections is lower than previously thought, we cannot be complacent. The steady and slow spread of the HIV infection is a worrying factor. The better understanding of India’s epidemic has certainly enabled us to have more focused HIV prevention and treatment strategies and more effective deployment of resources,” said Mr. Naresh Dayal, Secretary Health and Chair of the National AIDS Control Board.
Distribution of HIV

Source: NACO, India
People think that AIDS is someone else’s Problem, and it could NEVER happen to them!!!!

90% of HIV Positive Persons are unaware of their Status!!!
Trend of Voluntary Counseling and Testing at YRG CARE

People tested positive

MEN: 64%
WOMEN: Over 50%

Year


Clients

0 500 1000 1500 2000 2500 3000

VCT clients New registrations Initiated ART
Challenges

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Evolution of Risk-Groups

In India, Call Centers Warn Young Workers About HIV Risk

Wall Street Journal · August 9, 2006
Peter Womocott and Marilyn Clouse

As local music throbbed in the air, Rohit Nag and his friends relaxed on steps just off the dance floor at the nightclub Elevate in New Delhi. The 28-year-old Mr. Nag sports a thumb ring and four tattoos. His female companion, who works at the same call center in his town and resembles Journey's lead singer.

Young and free-spirited, Mr. Nag and other workers at India's call centers are reaping social freedoms that their parents continue to believe that new lifestyle brings new risks and the need for precautions, especially amid the looming threat of HIV/AIDS. "I use a condom during sex," he says. "And when we get tattoos, we insist on disposable needles."

As India grapples with a growing AIDS problem, activists and industry executives have identified the country's 1.3 million call center workers as a surprising new risk group, alongside truckers, migrant workers and prostitutes. Predominantly young, single and mobile, they are the traditionally strict family life and partying hard when they are not working diligently.

As a result, some companies in India are establishing in-house programs to educate their workers about the disease.

"If you look at the way the pandemic in India is progressing, call-center workers are at risk because they are young and social," says a spokesperson for Standard Chartered Bank PLC. The London-based bank, which has nearly one-fourth of its 40,000 employees at its 6,000 call center workers in Chennai for classroom-based AIDS education. Soon, HIV prevention materials will pop up on part of an online refresher course.

A study in February of 2006 found that 11% of 1,100 workers at a call center in Mumbai had used condom in their sexual partners. And contrast, 7% of 1,300 adults across the country said they had used more than five sexual partners, a sign of increasing risk.

In one five-year old study in India, 9% of 1,300 women take a survey against AIDS

The data speak to a dramatic lifestyle change in a society whose parents often arrange marriages for their children and rarely speak of sex. Perhaps most striking, the study included a 1,200 survey of 18-year-olds and found that 28% of them had used condoms in their sexual partners, a significant increase from previous surveys.

The study was conducted by the Global Business Coalition on HIV/AIDS, a nonprofit New York-based advocacy group, with the call center's cooperation.
Targeted Interventions

Source NACO
Risk Reduction Counseling Is Associated With Decreased HIV Transmission-Associated Behaviors in High-Risk Indian Heterosexuals

Sunil S. Solomon, MBBS, MPH.* Sunuti Solomon, MD,* Benoit R. Masse, PhD,† A.K. Srikrishnan, BA,* Geetha Beuchamp, MS,‡ Easter Thamburaj, MSW,* Menaka Gulvady, MA,* S. Anand, BSc, ADCA,* and Kenneth H. Mayer, MD†§

Objective: To estimate the incidence of HIV and study the impact of risk-reduction counseling (RRC) in a cohort of people with high-risk behavior for HIV transmission in Chennai, India.

Design: Prospective cohort follow-up of 500 HIV-negative people (250 men and 250 women) at increased risk for HIV acquisition in Chennai, India for a maximum of 1 year was conducted. They received RRC at 0, 6, and 12 months. Generalized estimating equation methodology was used to determine the statistical significance of differences reported in behavior between baseline, 6 months, and 12 months.

Results: The overall HIV incidence in this cohort was 0.44 per 100 person-years (95% confidence interval: 0.05-1.60). In the course of the study, both male and female participants reported statistically significant decreases in the number of different sexual partners, the number of new partners, and the proportion of sexual encounters with nonprimary partners. Participants who had more than 3 different partners at baseline and/or exchanged money for sex in the 6 months before enrollment demonstrated the greatest reductions in the number of different sexual partners.

Conclusions: Individualized sexual RRC seems to be a useful intervention to reduce risk-taking behavior among at-risk heterosexuals in India.

Key Words: risk-reduction counseling, high-risk individuals, counseling, HIV, India

(HIV infection was first detected in India in 1986 among sex workers in Tamil Nadu. Since then, the number of people living with HIV and AIDS (PLWHA) in India has been steadily increasing, and it is estimated that more than 5.1 million Indians were infected with HIV at the end of 2004. It has also been established that heterosexual contact is the predominant mode of transmission of HIV in India, accounting for 85.7% of all infections. The National AIDS Control Organization, India also estimated that 87.7% of all HIV infections in India occur in the most sexually active age group, 15-44 years. A study by Mehandile et al in Pune, India reported an HIV-1 prevalence of 21.2% among people attending sexually transmitted disease (STD) clinics.

Despite the numerous therapeutic innovations that have followed the discovery of HIV as the cause of AIDS, behavioral interventions to promote condom use are still among the most effective means of limiting the sexual spread of this infection. It is therefore essential to provide some form of risk-reduction counseling (RRC) or education to such individuals, especially those manifesting high-risk behavior. RRC has been reported to be effective in reducing risk of acquisition of HIV sexually transmitted infections (STIs) both in India and in industrialized countries. RRC has been shown to reduce the risk of acquiring HIV and other STIs, which have been shown to act as cofactors for HIV transmission.

As part of a study of risk factors of HIV seroconversion among high-risk individuals, our group evaluated the efficacy
## Use of Condom during Vaginal Sex

<table>
<thead>
<tr>
<th>Description</th>
<th>Men Low Risk</th>
<th>%</th>
<th>Women Low Risk</th>
<th>%</th>
<th>Men High Risk</th>
<th>%</th>
<th>Women High Risk</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>432</td>
<td>73.59%</td>
<td>381</td>
<td>89.44%</td>
<td>484</td>
<td>69.74%</td>
<td>42</td>
<td>11.26%</td>
</tr>
<tr>
<td>Rarely</td>
<td>79</td>
<td>13.46%</td>
<td>13</td>
<td>3.05%</td>
<td>77</td>
<td>11.10%</td>
<td>9</td>
<td>2.41%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>22</td>
<td>3.75%</td>
<td>2</td>
<td>0.47%</td>
<td>59</td>
<td>8.50%</td>
<td>13</td>
<td>3.49%</td>
</tr>
<tr>
<td>Always</td>
<td>29</td>
<td>4.94%</td>
<td>13</td>
<td>3.05%</td>
<td>63</td>
<td>9.08%</td>
<td>299</td>
<td>80.16%</td>
</tr>
</tbody>
</table>
Challenges

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Social Stigma

HIV-positive woman ‘killed’
AHMEDABAD, FEB. 16. An HIV-positive woman has allegedly been killed by her relatives at Dharasana village in Gujarat’s Valsad district, police said today.

She was found dead in her hut on the outskirts of the village on Monday. — UNI

NATIONAL

‘HIV stigma’ drives India suicide

A 15-year-old Indian boy whose parents had HIV was driven to suicide by the stigma associated with the virus, police say.

Santosh Baniya died of burn injuries after setting himself on fire in the western city of Ahmedabad last week.

Both his parents were diagnosed with HIV two years ago. They are among more than five million people infected with the virus in India.

Before he died the boy had expressed fears about surviving his parents.

Indian school throws out HIV boy

A four-year-old boy has been thrown out of nursery school in India because he has been found to be HIV-positive.

...
Medical Stigma

Remembering Ashok Pillai
(1968-2002)
Diagnosis of HIV infection

- Over 1000 labs in Chennai alone with no quality checks

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you conduct HIV tests in your lab?</td>
<td>772</td>
<td>366</td>
<td>1138</td>
</tr>
<tr>
<td>2. Do you provide pre-test counseling?</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>3. Approximately how long does this take?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt; 10 minutes</td>
<td>51%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 11-25 minutes</td>
<td>49%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hospital sued for wrong HIV report

BY T S Sekaran

Chennai, Feb 21: A leading private hospital in Adyar was sued for allegedly wrongly certifying a cook as having tested positive for HIV. The cook, R Mohanan (46), of Thiruvalluvar Nagar in Tiruvanmiyur had been provisionally selected by a Japanese firm in Algeria. His selection was subject to a medical test. He was sent to Malar Hospitals in Adyar, which, after tests on February 23 last year, said in its report that Mohanan had tested positive for HIV.

The hospital also declared as its final impression that he was not fit for the job. This resulted in the immediate cancellation of the provisional selection and job offer.

There was also immediate and disastrous effect of the report on his family. He and his wife Parimala started suspecting each other's fidelity, leading to constant and endless quarrels.

Later, Mohanan and his wife got tested at the Voluntary Health Services Hospital which, in the first week of March last year, declared both of them HIV negative.

Mohanan and his wife moved court and lodged a complaint against the hospital with the TN Consumer Disputes Redressal Commission, seeking Rs 15 lakh for the loss of job and another Rs 15 lakh towards compensation for the turmoil and mental agony. The commission has sent a notice.

The hospital refused to comment when approached by Express.

Test for HIV: A primer, P3
Voluntary Counseling and Testing
Occupation of HIV+ Clients

- Housewives: 22%
- Truck Driver: 9%
- Un-Employed: 2%
- CSW: 2%
- Unskilled: 17%
- Skilled: 17%
- Professional: 10%
- Student: 3%
- Others: 18%
- HCW: 0.1%

(Referral from other clinicians forms over 60%)

Over 20,000 walk-in clients

STD AIDSPCN
2254 2254

Tele Counseling
Cultural Issues

1) Marriage Counseling
2) Fertility Pressures
3) Reducing the risk of mother to child transmission by 98%
4) Counseling on Domestic Violence to reduce incidence of HIV
5) Couple and Family counseling
YRG CARE Matrimonial Service
Murthy & Bavana

• Murthy, an engineer
• Was pressurised to get married by parents
• Turned to the support services of YRG CARE
• His C.V. along with photo circulated to network NGO in Maharashtra
• Murthy flew to Mumbai & their love blossomed
• Married two months later
• Today proud parents of AKASH, HIV Negative
Legal Issues & Policy

Should HIV positive person marry?

Order on AIDS patients’ marriage sparks row

Should AIDS patients be allowed to marry?
Barren women are not welcome at a Valaikappu Ceremony
Baby at any cost

- Revathi was married to her uncle, her mother’s brother
- She was aware that he was HIV+ but agreed as it was the custom.
- Two years later she had pressure from the family for a baby
- Revathi travelled 400 miles to Chennai
- Had an AI which only the couple were aware
- And today they are proud parents of Aarthi
Children with HIV in India
Estimate for one year

27 million live birth/yr.

Low
0.4% HIV +ve
(1,08,000)

26%
(28,080)

42%
(45,360)

High
2%
(5,40,000)

26%
(1,40,000)

42%
(2,26,800)

NEVARAPINE @ Labour ➔ 1 Tablet & Syrup for the baby at 72 hours
Cost Rs.20/- per pt. Rs10.8 m ($ 0.216 m)
Policy has to be Revisited
- HIVNET012 (Single dose NVP)

• Kampala, Uganda
• Nevirapine 200mg single dose PO 2 hrs before delivery to mother
• Nevirapine syp 2mg/kg body weight within 72 hrs to the infant

• Nevirapine lowered the risk of HIV-1 transmission during the first 14-16 weeks of life by nearly 50% in a breastfeeding population.
ARV resistance after MTCT prophylaxis

• Characterization of Nevirapine resistance mutations in women with HIV-1, 6-8 weeks after Single dose Nevirapine (HIVNET012)
• Study confirms a higher rate of NVP resistance in women and further defines the pattern of NVPR mutations that emerge 6-8 weeks after single dose NVP prophylaxis.
• Differences by subtype C > D > A
• Resistance in the child – as high as 87% when only sd-NVP was given to the child and mother
Breastfeeding

- Culturally acceptable but increases risk of HIV
- Breast milk vs formula feeding for prevention of HIV transmission (Mashi Study)
- Alternate strategies
  - SWEN: Uganda, India, Kenya
  - PEPI Study (Resistance data not available)
- Cost-effectiveness – a factor to consider!
Circumcision

- Religion
- Cost-Effectiveness

“In the riots if the perpetrators or the Police are not able to identify victims with their religion they forcefully remove the pants of the victims to check whether they are circumcised or not. Once they find that the victim is circumcised, they find he is targeted without further analysing which community he belongs to.

For example in Bombay riot (1992) there is a case of a man who was frisked by the police for assessing whether he was a Muslim. However, out of fear he gave his name as Raju (a Hindu name) and, noticed that he was a circumcised Muslim, and fired at..."
Challenges

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National ART Program

- Provide free access to ART for 100,000 PLHA by 2007
- 188,000 by 2010 in 6 high prevalence states and Delhi
- 300,000 by 2012 all over the country
National ART Roll-Out

• Nearly 76,000 patients are receiving free ART at these centers

• In addition, 35,000 patients receiving ART in private sector (based on pharma sales)

• Pediatric formulations have been made available
No of ART Centers as on April 2007 and States covered
Current Regimens

- Almost all ARVs available in India
- Combination of stavudine, lamivudine and nevirapine is the most common
  - Advantages:
    - Cheap: about 800 rupees (20 USD) per month
  - Disadvantages:
    - Cross-resistance
    - Toxicities (stavudine almost never prescribed anymore in the US)
    - Future treatment options limited
- Zidovudine and efavirenz are the only other agents available thru GOI ART rollout programs
- Jan 2008 – 2 Centers started 2nd Line Regimen
# Low cost monitoring technologies

<table>
<thead>
<tr>
<th>Test</th>
<th>Gold Standard</th>
<th>Low Cost I</th>
<th>Low Cost II</th>
<th>Low Cost III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral Load</td>
<td>Roche Amplicor</td>
<td>Ultra Sensitive P24 Ag Perkin Elmer (US$ 15)</td>
<td>Cavidi Exavir (RTactivities) (US$ 20/-)</td>
<td>Real-Time PCR (ABBOTT) (US$ 38/-)</td>
</tr>
<tr>
<td></td>
<td>(US$ 90/-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD4</td>
<td>B.D. FACSCOUNT</td>
<td>TLC (&lt; US$ 1/-)</td>
<td>Coulter Cytosphere (US$ 15/-)</td>
<td>Guava Tech. Capillary Based Flowcyto (US$ 2/-)</td>
</tr>
<tr>
<td></td>
<td>(US$ 26/-)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CD4 + PVL = Rs.1000/-! At YRG CARE soon....
GRADUATED COST RECOVERY MECHANISM FOR ARV

• High Income group patients (20%) - 100%
  • Price of drugs matched with TNSACS pharmacy
• Middle income group patients (40%) - 75%
  • Price of drug lower than 75% of MRP
• Low socio-economic patients (20%) - 50%
  • Price of drug 50% of MRP
• Below Poverty Line (BPL) patients (20%) - 0%
## Indicators to Assess Ability to Pay

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Income</td>
<td>25%</td>
</tr>
<tr>
<td>2. Occupation</td>
<td>15%</td>
</tr>
<tr>
<td>3. Assets</td>
<td>10%</td>
</tr>
<tr>
<td>4. Consumption</td>
<td>10%</td>
</tr>
<tr>
<td>5. Medical Expenses</td>
<td>25%</td>
</tr>
<tr>
<td>6. Dependents</td>
<td>15%</td>
</tr>
</tbody>
</table>
### Status of Rollout (Jan 2008)

<table>
<thead>
<tr>
<th>TIER</th>
<th>#</th>
<th>%</th>
<th>TARGET%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 (free)</td>
<td>430</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Tier 2 (50% support)</td>
<td>418</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Tier 3 (25% support)</td>
<td>839</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Tier 4 (no support)</td>
<td>410</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2097</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
# Immunological Response in the 4 Tiers of GCR Model

<table>
<thead>
<tr>
<th>Tier</th>
<th>Baseline CD4</th>
<th>Gain in CD4 count in cells/μl at 6 months (n=1240)</th>
<th>Gain in CD4 count in cells/μl at 12 months (n=701)</th>
<th>Proportion with CD4 count greater than 350 cells/μl at 6 months (n[%])*</th>
<th>Proportion with CD4 count greater than 350 cells/μl at 12 months (n[%])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 (free)</td>
<td>168 (94 – 343)</td>
<td>121 (39 -239)</td>
<td>191 (49 – 370)</td>
<td>130 (47.6)</td>
<td>104 (63.8)</td>
</tr>
<tr>
<td>Tier 2 (50%)</td>
<td>169 (91 – 308)</td>
<td>113 (12 – 215)</td>
<td>142 (50 – 316)</td>
<td>102 (44.7)</td>
<td>77 (62.1)</td>
</tr>
<tr>
<td>Tier 3 (75%)</td>
<td>190 (102 – 345)</td>
<td>115 (12 – 230)</td>
<td>172 (50 – 307)</td>
<td>234 (46.4)</td>
<td>166 (58.9)</td>
</tr>
<tr>
<td>Tier 4 (100%)</td>
<td>242 (144 – 458)</td>
<td>115 (16 – 232)</td>
<td>154 (36 – 305)</td>
<td>142 (59.9)</td>
<td>83 (62.9)</td>
</tr>
</tbody>
</table>
Trends in Antiretroviral Price, VCT Clients, Patients in Treatment and on HAART

- Cost of ART
- New clients for Voluntary Counseling
- New patients registered
- New patients initiating ART

Cost of HAART in Rupees

- Generic Drugs

Cost of HAART in Rupees

- Number of persons

YEAR

1996 - 1 new patient a week
2005 - 10 new patients a day.
Patient attend 85 per day
20 bed ward
ICU facilities
Spectrum of Opportunistic Infections

**Oral Candidiasis**

**Pulmonary TB**

**Extrapulmonary TB**

**Herpes zoster**

**Dermatophyte**

**Herpes simplex**

**PCP**

**Staphylococcal skin infection**

**Cryptococcal meningitis**

**Toxoplasmosis**

**OHL**

**CMV retinitis**

**Cryptosporodial diarrhoea**

**Molluscum contigusum**

**Vernerial warts**

**Scabies**

Summary: A retrospective case note review of 100 AIDS patients attending a large Indian centre was performed. Of these 100 patients, 94% gave a history of heterosexual HIV transmission, 68% were male. The majority of females were aged 21 to 30 years. The most common mode of presentation was tuberculosis (61%), both pulmonary (48%) and extrapulmonary (13%). Oral candidiasis was the second most prevalent opportunistic infection. This study also highlights the difficulty in detecting AIDS cases in India owing to difficulties in taking a sexual history and lack of laboratory facilities.

Keywords: AIDS, opportunistic infection, tuberculosis, HIV transmission, India

INTRODUCTION

The prevalence of HIV infection in Tamil Nadu is increasing: in 1993, 11 out of every 1000 screened were HIV positive. In other Indian studies the prevalence of HIV infection in STD clinic attenders is.
Figure 2: Incidence of opportunistic infection in patients with and without HAART, 1996-2003

- Incidence of any OI in people without HAART
- Incidence of any OI in people with HAART
- Incidence of TB in people without HAART
- Incidence of TB in people with HAART

Kumarasamy et al. The Changing Natural history of HIV disease following generic HAART IN Southern India. Clinical Infectious Diseases 2005
Reduction in death rate following HAART
Kumarasamy, et al. IJMR 2005
Mismanagement

- Vitamins or HAART?
- Over the counter availability with pharmacists prescribing ART
Alternate Medical Systems and “Ducktors”

We Concentrate on Diseases Where any branch of science has nothing to offer. Ours is a cure and not just a relief.

Alternate Medical Systems and “Ducktors”

• Multiple systems of medicine
• Interactions between them not been studied extensively
• Besides these, multiple claims of cure

G.P. INSTITUTE (Hospital)

Of Alternate Therapies and Research Centre

(An Institute for HIV / AIDS, Cancer, Chronic Diseases)

G.P. INSTITUTE (Hospital)

Performance: Fast Treatment / Cure of HIV/AIDS

G.P. Institute / Hospital of Alternate Therapies & Research Centre, has come into light for the purpose of treating HIV / AIDS patients. It is a known fact, we have treated thousands of individuals to be cured. And it is an answer to the medical world today.

Dr P.S. Datharamane has come with an answer for this grave problem in the year 1985. Since then, he has been spearheading various prestigious institutions, Conferences, and representatives of the Government so that he can give the fruits of his rigorous research to all the suffering with HIV/AIDS.

In continuation of his efforts, he has established G.P. Institute/Hospital of Alternate Therapies & Research Centre, in to which a 50-bedded hospital in the heart of the city of Neyveli, is named after the physician for treating the patients.

In the institute till now more than 400 HIV/AIDS patients have been treated as out-patients with the combination of 4 unique medicines in an envelope prepared by Dr. P.S. Datharamane. The course for HIV / AIDS patients is 4 months.

Basing on the individual analysis:

• So far HIV patients who are having diseases like TB, Cancer etc, suffering with AIDS, are not only advanced but also 100% can be cured after completion of 4-month course with complete solution. The course of the patients varies negatively in 1 to 3 years according to the virus present in the system and the age when the patient. Follow our procedure after treatment without fail so it normal HIV counts to 0.500.

Practical experience:

Patients should follow certain restrictions advised by us during and after the course period in order to achieve the best result. It is also our practical experience that HIV/AIDS patients that are undergoing treatment or sexual intercourse i.e., before or after completion of treatment, which results in decrease of CDV count in the body. As such one will come down permanently to those who do not undergo excess of sexual intercourse.

The main symptom i.e., fatigue (weakness) subsides completely within 24 to 48 hours. Reduction of virus immediately which disappears during the daily and appetite is regained, it also increases reduction of virus immediately. The patient is not having any co-associate diseases like Cancer, TB, Malaka, Typhoid etc. Actually AIDS patients do not suffer from TB, but they suffer with enlarged spleen and kidney. If the AIDS patients are having fever it must be due to any associated disease/infectious like TB. Together, Neoplasia etc. It can be cured
Challenges in HAART

• Adherence
  – At least 95% adherence is mandatory
  – “poor” adherence = “poor” treatment outcome
  – Out-of-pocket payment hinders optimal adherence
  – Stigma interferes with dosing at home/ workplace
  – Indian culture
    • Stop when feeling better
    • Low levels of education
    • Sharing of medications
    • OTC prescriptions
  – DOTS vs DAART
  – Emergence of drug resistant strains
Adherence to antiretroviral therapy and virologic failure

HIV Drug Resistance among Treatment Naïve Populations

Sequence Note

HIV Type 1 Genotypic Variation in an Antiretroviral Treatment-Naïve Population in Southern India

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ABSTRACT

Most studies of HIV-1 drug resistance have examined subtype B viruses; fewer data are available from developing countries, where non-B subtypes predominate. We determined the prevalence of mutations at protease and reverse transcriptase drug resistance positions in antiretroviral drug-naïve individuals in southern India. The pol region of the genome was amplified from plasma HIV-1 RNA in 50 patients. All sequences clustered with HIV-1 subtype C. All patients had at least one protease and/or RT mutation at a known subtype B drug resistance position. Twenty percent of patients had mutations at major protease inhibitor resistance positions and 100% had mutations at minor protease inhibitor resistance positions. Six percent and 14% of patients had mutations at nucleoside reverse transcriptase inhibitor and/or nonnucleoside reverse transcriptase inhibitor resistance positions, respectively. Larger scale studies need to be undertaken to better define the genotypic variation of circulating Indian subtype C viruses and their potential impact on drug susceptibility and clinical outcome in treated individuals.
Treatment Failure and Resistance among 95 HIV-1 Infected Treatment Experienced Patients in Chennai, India

- No of patients screened = 95
- PVL > 400 copies/ml = 51 (53.7%)
- PVL < 400 copies/ml = 44
- No. of patients with PVL < 1000 copies/ml = 3
- No. of resistance tests performed = 44
- No. of samples that could not be amplified = 3
- Resistant to at least one NNRTI n(%) = 40 (91)
- Susceptible to all NNRTIs n(%) = 4 (9)
- Resistant to 3TC n(%) = 34 (77.4)
- Susceptible to 3TC n(%) = 6 (13.6)
- Resistant to 3TC n(%) = 2 (4.5)
- Susceptible to 3TC n(%) = 2 (4.5)

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Conclusion

- India still faces many challenges in the war against HIV
- Wars are won only one battle at a time
- India has made remarkable progress since 1986
  - Targeted Interventions
  - VCT in all districts
  - PMTCT
  - Free ART
  - Second-line in two centers
Namaste