BIOMEDICINE

versus

TRADITIONAL MEDICINE

Therapy for HIV/AIDS

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Infectious Minds Presentation
22 June 2011
BIOMEDICINE

Therapy for HIV/AIDS
Anti-Retroviral Therapy

• Highly active anti-retroviral therapy (HAART) is the current HIV/AIDS treatment modality

• Very effective in suppressing HIV-1 replication and reducing the mortality of HIV/AIDS patients

• The primary targets for anti-HIV-1 therapeutic development are two virally encoded enzymes: Reverse Transcriptase (RT) and Protease (PR)
• The Food and Drug Administration (FDA) has approved over 20 anti-HIV-1 drugs
  • majority are HIV-1 RT and PR inhibitors

• Various combinations of these inhibitors, so-called highly active anti-retroviral therapy (HAART)
  – potent, convenient and usually well tolerated
  – capable of reducing HIV blood concentration to undetectable values within a few weeks
  – inducing a robust and sustained CD4 T-cell gain
However, the current treatments used are:

– unable to eradicate HIV from infected individuals
– therapy must be lifelong
– potential for side effects
– pathogenesis of unexpected systemic complications owing to chronic inflammation & immune dysfunction associated to HIV infection
– life expectancy of people under ARV therapy remains lower with respect to that of uninfected people
– high costs for health care system
Bigger Picture!

- Dis-homogenous pattern of HIV disease worldwide (70% of the burden in Africa!)

- Access to HIV diagnosis, treatment and care are seriously limited in the geographical areas that are most affected

- Undiagnosed and untreated population represents an infected reservoir that increases HIV transmission
TRADITIONAL THERAPEUTIC OPTIONS

Two Examples

CHINA (Basic Science)

TANZANIA (Social Science)
Relatively fewer anti-HIV-1 therapeutics have been developed to target other steps of HIV-1 life cycle including entry, fusion, and integration (In-Woo Park et al. 2009)
• A panel of traditional Chinese medicinal herbal extracts obtained from plants in Hainan Island, China

• Extracts from Euphorbiaceae, Trigonostema xyphophylloides (TXE) and Dipterocarpaceae, Vatica astrotrichia (VAD) both block HIV-1 replication at the entry step

• Potential of developing these plant extracts as anti-HIV-1 entry inhibitors
Extracts from the stem of TXE and the stem of VAD:

- Inhibited HIV-1 replication without apparent effects on cell proliferation and cell survival
- Prevented HIV-infected cells from forming syncytia
- Potently blocked HIV-1 from entering its target cells
- Had little effects on post-entry HIV-1 gene expression
• TXE and VAD extracts possess potent inhibitory activities against HIV-1 replication and entry of both T and M tropic HIV-1 isolates

• These results suggest that TXE and VAD are potential biosources for further identification and isolation of active anti-HIV-1 constituents

• Identification of these active constituents will help establish the precise mechanisms of this entry inhibition as well as standardize the extracts for potential clinical translation
As in most parts of Africa, traditional medicine remains a relatively untapped resource in the overall struggle against AIDS (Kisangau D. et al. 2011)
• HIV/AIDS pandemic: currently the largest socio-economic challenge that faces Tanzania

• Traditional medicines are the most widely established and available health care system:
  • > 60% of the population depends on traditional medicines

• The ratio of Medical Doctors to traditional healers in Tanzania is estimated at 1:350
Community Based Initiative

- Tanga AIDS Working Group (TAWG) 
  ‘Traditional Medical Island of Hope’
- Build capacity of traditional healers
- Provide effective low cost herbal remedies
- Research on promising herbs
- Ensure sustainable supply of medicinal plants
- Treated 4,500 AIDS patients with opportunistic infection; currently over 1300 patients
• Efforts are underway to scale up TAWG’s experience to other parts of Tanzania and possibly other regions of Africa

• The World Bank Indigenous Knowledge for Development Program: supported a community-to-community exchange of experiences between healers, people living with AIDS and staff working with patients with similar communities across the country.
Institution Based Initiative

• Gaps exist between THs and biomedical scientists in health research

• Recognition of THs as stipulated:
  – *National Health Policy, the Policy and Act of Traditional, complementary and alternative medicine*

• The priority institution:
  – *The Institute of Traditional Medicine (ITM), Started in 1974, Today – A Centre of Excellence!*
CONCLUSION

Leveraging traditional and modern knowledge systems to help combat HIV/AIDS
• HIV is now a chronic illness in patients with continued treatment access and excellent long-term adherence

• Huge efforts are ongoing to reproduce these results even in poor and disadvantaged settings

• All currently FDA-approved anti-HIV drugs are chemically synthesized
• Development involves an extremely long cycle of research, design and optimization, thus these drugs are very expensive

• Use is often limited by side-effects and non-adherence issues

• In contrast, medicines of natural origins such as herbs have a much short development cycle and relatively inexpensive
• Importantly, the toxicity of nature-derived medications is rarely an issue (mainly address opportunistic infections)

• There is need to further investigate and develop alternative anti-HIV therapy
  – ultimately affordable and available to all HIV/AIDS-affected individuals including those in developing and under-developed countries
RECOMMENDATIONS!

It is crucial to bridge the yawning gap between traditional and modern health sectors.
• Community seminars should be conducted
  – Exchange knowledge around themes associated with HIV/AIDS to improve the skills and knowledge base of all concerned

• Sub-communities representing:
  – Traditional Healers
  – Care givers / Social Scientists
  – Medical Doctors / Research Scientists
  – People living with HIV or AIDS, PLWHA
• The Indigenous Knowledge Program has also helped incorporate the TAWG model into the World Bank supported Multi-country HIV/AIDS Program for Africa (MAP)

• In countries such Guinea, Ghana, Ethiopia and Burundi, traditional healers are being incorporated into national AIDS programs that have a country wide impact
THANK YOU!
References


