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ON

HIV/AIDS, STD'S & REPRODUCTIVE HEALTH & HYGIENE

 30TH APRIL – 1ST MAY 2026

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Proceedings
of
National Conference
on
“HIV/AIDS, STD’s & Reproductive Health & Hygiene”

Chief Patron

Shri V. K. N. Bhardwaj

Chairman, IPH&H & FIMT Group of Institutions

Patron

Dr. Nalini Joshi

Executive Director, Institute of Public Health & Hygiene

30th April – 1st May, 2026

First Impression: 2026

ISBN:

Published by: Institute of Public Health & Hygiene, RZ-A-44,
Mahipalpur, Delhi – 110037, (India)

India Copyright: IPHH, New Delhi, India

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Address for Correspondence: Institute of Public Health & Hygiene,
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Chairman's Message

It gives me great pleasure, in this 50th Golden Jubilee Year (2026) of the Institute of Public Health & Hygiene (IPH&H), to present the proceedings of the National Conference on “HIV/AIDS, STDs & Reproductive Health & Hygiene.”

The conference addresses critical and ongoing public health challenges, emphasizing awareness, prevention, and equitable access to care. These issues significantly impact both individual well-being and broader social and economic development.

Bringing together academicians, healthcare professionals, researchers, and policymakers, the conference has fostered meaningful dialogue, shared evidence-based insights, and explored innovative approaches in prevention, diagnosis, treatment, and outreach. The proceedings reflect a multidisciplinary collection of research, case studies, and expert perspectives aimed at strengthening public health practices, particularly for vulnerable populations.

I extend my sincere gratitude to all contributors and participants for making this initiative impactful. I am confident that the insights generated will inspire continued research and contribute to a healthier, more informed society.

Warm Regards,
V. K. N. Bhardwaj
Chairman
IPH&H & FIMT Group of Institutions

Preface

It gives us immense pleasure to present the proceedings of the National Conference on “HIV/AIDS, STD’s & Reproductive Health & Hygiene,” organized by the Institute of Public Health & Hygiene (IPH&H), on 30th April – 1st May 2026. This year holds special significance as it marks the Golden Jubilee (50th year) of the Institute, celebrating five decades of dedicated service, academic excellence, and contributions to public health.

In the context of evolving public health challenges, issues related to HIV/AIDS, sexually transmitted diseases, and reproductive health & hygiene continue to demand focused attention, awareness, and evidence-based interventions. This conference has been conceived as a platform to bring together academicians, healthcare professionals, researchers, and policymakers to deliberate on these critical concerns and explore effective strategies for prevention, care, and community health improvement.

The proceedings present a collection of research papers and case studies that reflect diverse perspectives and innovative approaches in the field. These contributions aim to strengthen knowledge, support informed decision-making, and promote collaborative efforts in addressing public health challenges.

We express our sincere gratitude to all speakers, contributors, participants, and the organizing committee for their valuable support in making this conference a success. As we commemorate this milestone year, we hope that this compilation will serve as a valuable academic resource and inspire continued research and meaningful action toward improving public health outcomes.

Dr. Nalini Joshi

Executive Director

Institute of Public Health & Hygiene

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Effect of HIV/AIDS on Biomolecules

Dr. Anita Mukherjee

Principal, Institute of Public Health & Hygiene

Abstract

Biomolecules are affected by HIV/AIDS through effects on host cells. HIV virus replication causes effects on cellular mechanisms which leads to oxidative stress. It affects lipids, carbohydrates, proteins, nucleic acids and antioxidant mechanisms.

Introduction

1. Lipids (Lipid Metabolism and Membrane Structure)

- **Cholesterol Metabolism:** High increased levels of cholesterol, 7-dehydrocholesterol, and glycerol phosphodiesterase in T lymphocytes, affecting membrane biosynthesis, are associated with high HIV viral loads.
- **Lipodystrophy:** Abnormal fat redistribution (lipodystrophy), including loss of subcutaneous fat and accumulation of visceral fat, is caused by chronic HIV and older antiretroviral therapy (ART).
- **Membrane Fluidity:** Cholesterol-rich “lipid rafts” on the host cell membrane bud HIV-1. The viral envelope is more rigid than the host membrane due to high cholesterol concentrations, which is essential for fusion and infectivity.
- **Dyslipidemia:** Patients often experience high triglycerides and low HDL cholesterol, increasing cardiovascular risks.

2. Proteins and Enzymes

- **Structural and Regulatory Proteins:** Proteins like Tat, gp120, and Nef, which are toxic and alter host cell signaling, leading to apoptosis (cell death), are produced by HIV.
- **Antioxidant Enzymes:** There is a significant reduction in the activity of superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx), which are crucial for detoxifying free radicals.
- **Immune Proteins:** Deficiencies in essential amino acids, reducing the synthesis of proteins, antibodies (immunoglobulins), and cytokines

necessary for fighting infection, are caused by HIV-associated malnutrition.

- Blood-Brain Barrier Proteins: Viral proteins (Tat, gp120) damage the blood-brain barrier by reducing the expression of tight junction proteins like claudin-5 and zonula occludens-1 (ZO-1).

3. Nucleic Acids (DNA/RNA)

- Oxidative DNA Damage: Elevated levels of oxidative DNA damage, specifically in the form of 8-hydroxy-2-deoxyguanosine, are caused by HIV infection.
- Mitochondrial DNA (mtDNA) Damage: Mitochondrial toxicity by inhibiting mtDNA polymerase-gamma, leading to reduced mtDNA synthesis, is caused by ART, particularly older nucleoside reverse transcriptase inhibitors (NRTIs).
- RNA Interference: HIV uses the host cell machinery to transcribe its own RNA, hijacking the molecular machinery to produce viral proteins.

4. Carbohydrates and Energy Metabolism

- Glycolysis Shift: HIV-1 reprograms host metabolism to increase glucose uptake (glycolysis) to fuel viral replication.
- Insulin Resistance: Decreased insulin sensitivity and higher glucose levels, increasing the risk of diabetes, are associated with chronic infection and some ART regimens.
- ATP Production: Due to mitochondrial damage, oxidative phosphorylation is often impaired; glycolysis increases, leading to cellular energy crises.

Research Question

Finding changes in biomolecules in HIV/AIDS patients.

Observations

Impact of HIV on Lipids

- Untreated Infection: Low total cholesterol, low-density lipoprotein (LDL-C), and high-density lipoprotein (HDL-C), alongside elevated triglycerides, has been found to be triggered by inflammation and cytokines.

- **Disease Progression:** Advanced HIV disease has been found associated with less favorable (lower HDL, higher triglycerides) lipid profiles.
- **Chronic Inflammation:** HIV induces a pro-inflammatory state that alters lipid and glucose metabolism.

Impact of Antiretroviral Therapy (ART)

- **Lipid Increases:** Initiating ART usually reverses low cholesterol levels, often raising total cholesterol, LDL, and triglycerides.
- **Drug-Specific Effects:** Protease inhibitors (PIs) are strongly associated with high triglycerides and high LDL. Some NRTIs are linked to lipodystrophy and increased metabolic issues, while newer drugs are often more metabolically neutral.
- **Lipodystrophy:** Both HIV and certain ART combinations can cause fat redistribution, resulting in insulin resistance and higher cardiovascular risk.

Effects of HIV/AIDS on Proteins

- **Viral Protein Production:** Pathogenic proteins like envelope protein gp120 and negative factor Nef that cause oxidative stress, damage cells directly, and aid viral replication are produced by HIV.
- **Neurotoxicity & Brain Damage:** Proteins such as Tat and gp120 can cross the blood-brain barrier, triggering neurotoxicity, causing inflammation, and contributing to cognitive impairment.
- **Immune System Exhaustion:** HIV disables host cells by manipulating protein function, including the destruction of CD4+ T-cells and exhaustion of killer T-cells.
- **Wasting and Metabolism:** The infection causes “protein wasting,” where the body breaks down its own proteins due to chronic inflammation, poor absorption, and altered metabolism.

Effects of HIV/AIDS on Carbohydrates

- **Insulin Resistance:** HIV infection itself, along with older ART, causes insulin resistance, leading to elevated blood glucose levels and a high prevalence of metabolic syndrome.
- **Metabolic Complications:** Patients experience diabetes and hyperglycaemia, with some protease inhibitors acutely reducing insulin sensitivity.
- **Malabsorption:** Carbohydrate and fat malabsorption are common, leading to nutrient loss and wasting, especially in advanced AIDS.

- **Increased Metabolic Demand:** HIV-related infections and chronic inflammation raise resting energy expenditure by 10%–30%.

Specific Effects of HIV-1 on Nucleic Acids

1. Reverse Transcription and Genome Conversion

- **RNA to DNA Conversion:** The HIV-1 reverse transcriptase (RT) enzyme converts the viral ssRNA genome into complementary DNA (cDNA), a crucial step for infection.
- **Strand Transfer and Recombination:** HIV-1 nucleocapsid (NC) protein promotes rearrangement of nucleic acids during reverse transcription, facilitating strand transfer for genetic recombination and repair.
- **Unintegrated DNA:** A large amount of viral DNA generated during this process remains unintegrated in the cytoplasm, which can lead to cellular damage and apoptosis.

2. Integration into Host Genome

- **Proviral Integration:** Viral DNA is imported into the nucleus and integrated into the host cell's DNA by the integrase enzyme. Once integrated, this DNA (provirus) remains a permanent part of the cell.
- **Integration Sites:** HIV-1 preferentially integrates into transcriptionally active genes within the host cell chromosome, aided by the LEDGF/p75 protein.

Conclusion

All major biomolecules are affected by HIV/AIDS along with changes in CD4 cells. Treatments and remedies must be found addressing these aspects as well.

Current Scenario of HIV/AIDS in India

Dr. Preeti Mudgal

Institute of Public Health & Hygiene

Abstract

Human Immunodeficiency Virus (HIV) is a virus that attacks the immune system, leading to Acquired Immunodeficiency Syndrome (AIDS) if untreated. HIV/AIDS remains a significant public health concern globally and in India, though substantial progress has been made in its prevention and control.

Introduction

HIV/AIDS continues to be a major public health challenge worldwide. India has made remarkable progress in controlling the epidemic through national programs, policy frameworks, and healthcare infrastructure. The current scenario reflects significant improvement in key epidemiological indicators while highlighting persistent challenges in reaching all affected populations.

Progress in India

India has made remarkable progress in controlling HIV/AIDS. Infection rates and AIDS-related deaths have declined substantially over the past two decades. The National AIDS Control Programme (NACP) has been instrumental in expanding testing, treatment, and prevention services across the country.

National Programs

India has implemented several programs to control HIV/AIDS:

- National AIDS Control Programme (NACP) – a comprehensive framework for prevention and treatment
- Prevention of Parent-to-Child Transmission (PPTCT) program
- Free Antiretroviral Therapy (ART) program through government ART centres

- Targeted Interventions for high-risk populations including sex workers, injecting drug users, and MSM
- HIV/AIDS (Prevention and Control) Act, 2017 – providing legal protection against discrimination

Key Challenges

Despite progress, several challenges remain in India's response to HIV/AIDS:

- Social stigma and discrimination discouraging testing and treatment uptake
- Regional disparities in HIV prevalence and healthcare access
- Gaps in awareness among vulnerable and marginalized populations
- Ensuring universal treatment coverage and retention in care
- Addressing co-infections, particularly TB-HIV co-infection

Conclusion

The current scenario of HIV/AIDS in India reflects significant progress with ongoing challenges. While infection rates and deaths have declined, sustained efforts are needed to address stigma, improve awareness, and ensure universal treatment coverage. With strong policies and community participation, India is on the path to controlling and eventually eliminating HIV/AIDS.

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Role of Radiology in the Diagnosis of HIV/AIDS and Its Related Pathologies: A Review

Divya Jha

Institute of Public Health and Hygiene

Preeti Kumari

Mbarara University of Science and Technology

Abstract

Acquired Immunodeficiency Syndrome (AIDS) is caused by Human Immunodeficiency Virus (HIV), which causes a wide spectrum of infections and malignancies in an individual. This narrative review examines the critical role of diagnostic imaging in the clinical management of HIV/AIDS. While serological testing remains the primary means of diagnosis, radiology is indispensable for staging the disease, identifying life-threatening opportunistic infections (OIs), and diagnosing AIDS-defining malignancies. The review details how various imaging modalities are utilized based on clinical needs. Plain radiography and ultrasound serve as essential, accessible first-line tools, especially in resource-limited settings. Computed Tomography (CT) provides detailed cross-sectional evaluations for thoracic and abdominal complications. MRI is the gold standard for CNS complications. Advanced techniques, including PET/CT and SPECT, are highlighted for their utility in staging malignancies and monitoring neurocognitive disorders.

Introduction

AIDS indicates the late stage of HIV infection, marked by severe immunosuppression, usually shown by CD4+ T-cell counts below 200 cells/ μ L. This weakened immune state makes patients vulnerable to opportunistic infections and cancers, which often present with non-specific symptoms. As the CD4+ T-cell count drops, specific

radiological patterns become clearer, helping clinicians improve their diagnosis.

Radiology is crucial in HIV management, providing non-invasive ways to diagnose serious opportunistic diseases and monitor treatment response. It helps with early detection of disease, locating affected areas, guiding biopsies and procedures, and evaluating treatment effectiveness.

Statement of Problem

While the widespread implementation of ART has successfully transformed HIV/AIDS into a manageable chronic condition, patients continue to experience a disproportionately high incidence of multi-organ comorbidities and opportunistic infections. A critical challenge remains in the diagnostic mimicry of HIV-associated pathologies, where various fungal, bacterial, and viral infections often present with overlapping imaging features on CT and MRI. Furthermore, as the HIV-positive population ages, there is an increasing burden of non-AIDS-defining conditions such as premature coronary artery disease and metabolic bone disorders that require specialized imaging for early detection.

Research Question

RQ1: What is the Role of radiology in HIV/AIDS treatment?

Imaging Modalities in AIDS

AIDS remains one of the most complex and multisystemic diseases in clinical medicine, affecting virtually every organ in the body. Most imaging modalities have certain roles in the evaluation of pulmonary and systemic complications in immunocompromised patients, including those with HIV/AIDS.

Plain Radiography (Chest X-Ray)

Plain chest radiography is the most widely available and frequently employed first-line imaging tool in AIDS patients. While chest radiography provides a rapid, low-cost assessment, changes noted on

X-rays may not definitively identify the etiological agent involved in the infection.

Computed Tomography (CT)

CT is among the most powerful imaging tools for AIDS, offering detailed cross-sectional evaluation of the chest, abdomen, and brain. Opportunistic infections in people living with HIV are readily detected with thoracic CT, though differential diagnosis remains a challenge, particularly given overlapping imaging appearances among various pathogens.

Magnetic Resonance Imaging (MRI)

MRI is the modality of choice for evaluation of CNS complications of AIDS, providing superior soft-tissue contrast and multi-planar capability compared to CT. HIV encephalopathy shows a diffuse bilateral pattern, whereas progressive multifocal leukoencephalopathy (PML), HIV-related primary CNS lymphoma, and CNS toxoplasmosis show focal patterns on MRI.

Ultrasound

Ultrasound is a radiation-free, portable, and cost-effective modality with growing relevance in AIDS management, particularly in resource-limited settings. Portable ultrasound machines make point-of-care ultrasonography suitable for resource-limited settings where radiological equipment and expertise are scarce.

Positron Emission Tomography (PET) and PET/CT

Nuclear medicine imaging, particularly ¹⁸F-FDG PET/CT, has become an increasingly important modality in the staging and monitoring of AIDS-related malignancies and infections. PET and SPECT techniques are particularly useful for differentiating opportunistic infections such as toxoplasmosis from viral-mediated neoplasms such as CNS lymphoma.

Single Photon Emission Computed Tomography (SPECT)

SPECT has an established role in the neurological evaluation of AIDS patients, particularly in distinguishing between CNS pathologies that appear similar on structural imaging.

Functional MRI (fMRI) and Advanced MRI Techniques

Beyond conventional MRI, advanced neuroimaging techniques offer deeper insights into the functional and microstructural consequences of HIV infection. By exploiting the blood oxygenation level dependent (BOLD) effect, fMRI has been useful in monitoring brain activation and detecting early cerebral injury in HIV patients.

Radiological Manifestations in AIDS

Pulmonary Manifestations

- **Pneumocystis jirovecii Pneumonia (PCP):** Chest radiography typically shows bilateral, diffuse interstitial infiltrates. HRCT classically shows ground-glass opacities (GGO) with a perihilar distribution.
- **Mycobacterium Tuberculosis (TB):** In advanced AIDS, TB often lacks classic upper-lobe cavitation. Instead, imaging shows miliary patterns, mediastinal lymphadenopathy, and pleural effusions.
- **Fungal & Viral Infections:** Cryptococcosis and Cytomegalovirus (CMV) patterns on CT.

Central Nervous System (CNS) Complications

- **Toxoplasmosis vs. Primary CNS Lymphoma (PCNSL):** Toxoplasmosis typically presents as multiple, small, ring-enhancing lesions in the basal ganglia. PCNSL often presents as a larger, single lesion with subependymal spread.
- **Progressive Multifocal Leukoencephalopathy (PML):** MRI identifies patchy, asymmetric white matter lesions caused by the JC virus.
- **HIV-Associated Neurocognitive Disorders (HAND):** Role of volumetric MRI in detecting cerebral atrophy.

Abdominal and Gastrointestinal Pathologies

- **Lymphadenopathy:** CT is used to detect massive mesenteric or retroperitoneal lymphadenopathy, often indicative of *Mycobacterium avium* complex (MAC) or Lymphoma.
- **HIV-Associated Nephropathy (HIVAN):** Ultrasound reveals enlarged, highly echogenic kidneys.
- **AIDS Cholangiopathy:** MRCP is used to visualize papillary stenosis or intrahepatic ductal strictures.

Malignancies

- Kaposi Sarcoma (KS): On imaging, KS can appear as flame-shaped pulmonary opacities or hypervascular nodules in the liver and spleen.
- Non-Hodgkin Lymphoma (NHL): Usually presents aggressively on CT/PET as bulky lymphadenopathy or extranodal involvement.

Conclusion

Radiology plays an indispensable role in the diagnosis and management of AIDS-related pathologies. A multimodality imaging approach, combined with clinical and laboratory findings, is essential for accurate diagnosis. Early and precise radiological interpretation can significantly reduce morbidity and mortality in HIV/AIDS patients.

Future Directions

- Integration of artificial intelligence (AI) in imaging analysis
- Development of quantitative imaging biomarkers
- Improved access to advanced imaging in resource-limited settings

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PEP in Action: A Lifesaving Intervention in HIV Prevention

Ruchi Bhatnagar

Institute of Public Health & Hygiene

Abstract

Post-Exposure Prophylaxis (PEP) is a critical medical intervention used after potential exposure to HIV to prevent infection. This paper discusses the indications, drug regimen, mechanism of action, duration, efficacy, and follow-up schedule for PEP, along with the importance of universal precautions in healthcare settings.

Introduction

Post-Exposure Prophylaxis (PEP) refers to the use of antiretroviral medicines after a single high-risk event to prevent HIV infection. It must be initiated within 72 hours of potential HIV exposure and continued for 28 days. PEP is not a substitute for regular HIV prevention methods but serves as an emergency intervention.

Indications for PEP

PEP is indicated in the following scenarios:

- Accidental needlestick injuries in healthcare workers
- Unprotected sexual exposure to a known HIV-positive individual
- Sexual assault
- Sharing of needles or syringes with a person of unknown HIV status

Duration of PEP

The standard duration is 28 days of continuous therapy without interruption.

Efficacy of PEP

Post-exposure prophylaxis can reduce the risk of HIV infection by more than 80% when taken promptly and as prescribed.

Schedule of PEP

Initial Assessment

- Exposure risk evaluation
- HIV status of source (if known)
- Baseline HIV testing of exposed individual

Drug Regimen

As per WHO recommendations, a three-drug regimen is most preferred:

- Tenofovir (TDF)
- Lamivudine (3TC) or Emtricitabine (FTC)
- Dolutegravir (DTG) or Efavirenz (EFV)

Follow-Up Schedule

- Baseline HIV test at initiation
- Repeat testing at 4–6 weeks and then at 3 months
- Monitoring for drug toxicity and adherence

WHO guidelines emphasize prescribing the full 28-day course at once to improve adherence.

Mode of Action of Drugs

Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

Examples: Tenofovir, Lamivudine. Inhibit reverse transcriptase enzyme and prevent reverse transcription of viral RNA into DNA.

Integrase Strand Transfer Inhibitors (INSTIs)

Example: Dolutegravir. Checks the integration of viral DNA into the host genome.

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

Example: Efavirenz. Binds directly to reverse transcriptase and inhibits its functions.

Universal Precautions

Prevention is better than cure. Healthcare workers must follow safe laboratory practices:

- Treat all blood and body fluids as potentially infectious; use gloves, masks, gowns, and eye protection
- Avoid recapping used needles; dispose of sharps in puncture-proof containers
- Use color-coded biomedical waste containers
- Follow institutional protocols and wash hands before and after any procedure
- Wash the affected area with soap and water after exposure, report immediately, and start PEP at the earliest

Conclusion

Post-exposure prophylaxis is one of the most critical interventions in preventing HIV infection following accidental or high-risk exposure. Timely initiation, adherence to the 28-day regimen, and proper follow-up significantly reduce infection risk. Continued awareness, training, and accessibility of PEP services are key to reducing HIV transmission globally.

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HIV/AIDS: Modes of Transmission in India

Shruti Malla

Microbiology Faculty, IPHH, Mahipalpur

Abstract

Human Immunodeficiency Virus (HIV) remains a significant public health issue in India, even though considerable improvements have been made in its prevention and control. This paper discusses the primary modes of HIV transmission in India, such as sexual contact, use of contaminated injecting equipment, transmission from mother to child, and exposure through infected blood or unsafe medical procedures.

Introduction

HIV is a retrovirus that targets CD4+ T lymphocytes, gradually weakening the immune system and leading to Acquired Immunodeficiency Syndrome (AIDS) if left untreated. Since its identification in India during the 1980s, HIV has posed major challenges to public health. Although initiatives like the National AIDS Control Programme (NACP) have significantly reduced prevalence rates, the infection still represents a considerable burden.

The pattern of HIV transmission in India differs from that seen in many developed nations. While homosexual transmission and injecting drug use dominate in some parts of the world, the Indian epidemic is largely driven by heterosexual transmission.

Modes of Transmission

Sexual Transmission

In India, sexual contact is the leading mode of HIV transmission, contributing to nearly 80–90% of cases. Most infections occur through heterosexual relationships. Risk factors include unprotected intercourse, multiple sexual partners, and interaction with commercial sex workers.

Social stigma associated with sexual health discourages individuals from seeking testing and treatment, resulting in late diagnosis and continued spread. Gender inequality further increases vulnerability, particularly among women. Promoting condom use, awareness, and sex education is crucial.

Injecting Drug Use

Sharing of contaminated needles among injecting drug users is an important mode of HIV transmission, especially in northeastern states like Manipur, Mizoram, and Nagaland. Individuals in this group may also engage in unsafe sexual behaviors, increasing overall risk. Preventive strategies like needle exchange programs and opioid substitution therapy have been introduced.

Mother-to-Child Transmission

Mother-to-child transmission (MTCT), also known as vertical transmission, can occur during pregnancy, childbirth, or breastfeeding. Without medical intervention, the transmission risk ranges between 15% and 45%. With appropriate ART, the risk can be reduced to below 5%. India has introduced the Prevention of Parent-to-Child Transmission (PPTCT) program to address this route.

Blood Transfusion and Unsafe Medical Practices

The risk of HIV transmission through blood transfusion has decreased significantly due to mandatory screening of donated blood. However, unsafe practices such as reuse of needles and inadequate sterilization of instruments can still spread the virus, particularly in rural and underserved areas.

Regional and Socio-Demographic Variations

HIV transmission in India shows considerable variation across regions and populations. Northeastern states have higher prevalence due to injecting drug use, while urban areas show more cases related to sexual transmission. Migrant workers and truck drivers are high-risk groups due to mobility and multiple partners. These differences highlight the need for targeted interventions.

Conclusion

HIV transmission in India is influenced by multiple factors, with sexual transmission being the most dominant. Despite progress through national programs, challenges like stigma, lack of awareness, and regional disparities remain. A comprehensive strategy involving education, early diagnosis, treatment, and targeted interventions is essential to control the spread of HIV and move towards its elimination.

Management of HIV-Positive Patients in the Operation Theatre

Ms. Mansi

Institute of Public Health & Hygiene

Abstract

Managing HIV-positive patients in the operation theatre requires a careful balance of safety protocols and compassionate care. This paper discusses universal precautions, sterilization procedures, personal protective equipment (PPE), and the ethical considerations essential for safe surgical management of HIV-positive patients.

Introduction

HIV-positive patients may require surgical intervention for various conditions. Managing these patients in the operation theatre (OT) requires adherence to strict infection control protocols to protect both the patient and healthcare workers, while ensuring that HIV-positive patients receive the same standard of surgical care without discrimination.

Universal Precautions

Universal precautions form the cornerstone of infection prevention in surgical settings. All blood and body fluids must be treated as potentially infectious, regardless of the patient's known HIV status. Key precautions include:

- Use of appropriate personal protective equipment (PPE) – gloves, masks, gowns, eye protection, and face shields
- Safe handling and disposal of sharps in puncture-proof containers
- Strict hand hygiene before and after all procedures
- Avoidance of double-gloving where recommended for high-risk procedures

Sterilization and Disinfection

Effective sterilization of all surgical instruments is essential. Standard autoclaving procedures are effective against HIV. High-level disinfection protocols must be followed for semi-critical equipment. The OT environment must be thoroughly cleaned and disinfected between cases.

Anesthetic Considerations

Anesthesiologists must be aware of potential drug interactions between anesthetic agents and antiretroviral therapy. Pre-operative assessment should include a review of the patient's ART regimen, CD4 count, viral load, and any organ dysfunction that may affect anesthetic management.

Post-Exposure Protocol

In the event of accidental exposure (needlestick, splash), health care workers should immediately wash the area with soap and water, report the incident to the designated authority, and initiate PEP as soon as possible, ideally within 1–2 hours and no later than 72 hours.

Ethical Considerations

HIV-positive patients have the right to surgical care without discrimination. Healthcare workers must maintain patient confidentiality and avoid stigmatizing behavior. The availability of modern ART means that many HIV-positive patients have undetectable viral loads and pose minimal transmission risk when universal precautions are followed.

Conclusion

Handling HIV-positive patients in the operation theatre is safe when proper precautions are followed. Universal precautions, effective sterilization, and use of PPE are essential to prevent infection transmission. HIV patients should be treated with respect, dignity, and without discrimination. With advancements in medical science, HIV is no longer a barrier to surgical care, provided that appropriate management protocols are implemented.

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HIV and Immunity in Ayurveda

Dr. Vikas Dixit

Ayurvedacharya, Mata Anandmayi Hospital, Varanasi

Abstract

Insights of Ayurveda in boosting immunity have been highlighted in this paper. Ayurveda does not look at HIV directly as a virus, but as “Ojas Kshaya” — a decline in the body’s vital immunity. This paper examines Ayurvedic approaches to immune enhancement as supportive therapy alongside modern antiretroviral treatment.

Introduction

Ayurveda doesn’t look at HIV directly as a virus, but as “Ojas Kshaya” — a decline in the body’s vital immunity. Ojas is considered the essence of our immune strength. When Ojas becomes weak, the body cannot fight off external diseases.

Research Question

Finding mechanisms of increasing immunity by Ayurvedic methods for HIV/AIDS patients.

Ways to Boost Immunity in Ayurveda

Rasayana Therapy

Herbs like Ashwagandha, Giloy, Amla, Shatavari, and Yashtimadhu are Rasayanas. They increase Ojas, support CD4 cells, and reduce fatigue and weakness.

Diet and Lifestyle

Sattvic food, warm water, regular sleep-wake cycles, yoga, and pranayama strengthen digestive fire (Agni) and improve immunity.

Panchakarma

Under a doctor’s guidance, detox procedures like Vamana and Virechana help remove toxins and give strength to the immune system.

Ayurveda's Role in HIV

The goal of Ayurveda is not to kill the virus, but to make the body strong enough to fight the symptoms of the disease. Research shows that when Ayurvedic medicines are taken along with ARV, quality of life can improve and side-effects may be reduced.

Important Note

The Ministry of Ayush also accepts that the viral nature of HIV cannot be denied. Ayurveda should be taken as supportive therapy, not a replacement for ARV medicines. Always consult your HIV doctor before starting any herb.

Conclusion

In Ayurveda, immunity equals Ojas. Increasing Ojas makes the body stronger. However, for HIV, ARV medicine is the first and essential line of treatment. Ayurveda can be its companion, not a substitute.

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HIV/AIDS and Its Drug Therapy

Dr. Sarika

*Associate Professor, Institute of Public Health and Hygiene (IPHH),
Mahipalpur, New Delhi*

Abstract

Acquired Immunodeficiency Syndrome (AIDS) is a serious, long-term condition caused by the Human Immunodeficiency Virus (HIV). This virus primarily targets the immune system, especially CD4 cells, weakening the body's ability to fight infections and diseases. Current management mainly involves Antiretroviral Therapy (ART), which consists of a combination of drugs that inhibit viral replication. Preventive strategies like Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP) are also widely used to reduce the risk of infection.

Introduction

Human Immunodeficiency Virus (HIV) is a persistent viral infection that attacks the immune system, particularly CD4+ T lymphocytes. If left untreated, it progresses to Acquired Immunodeficiency Syndrome (AIDS), the most advanced stage of the disease. The development of Antiretroviral Therapy (ART) has significantly changed the prognosis of HIV infection, transforming it from a fatal illness into a manageable chronic condition.

Statement of the Problem

Although significant advancements have been made in ART, HIV/AIDS remains a global health challenge, with millions of people affected worldwide. While ART has improved life expectancy and disease management, several issues persist, including limited access to treatment, poor adherence, drug resistance, and long-term side effects. Recent innovations, including long-acting injectable therapies such as cabotegravir/rilpivirine and newer agents like lenacapavir, show promise but face challenges of cost and accessibility.

Pharmacology and Drug Resistance

Antiretroviral therapy has significantly reduced HIV-related illness and mortality. However, the emergence of drug-resistant HIV strains continues to threaten treatment success. Factors such as poor adherence, inadequate drug regimens, and widespread use of ART contribute to resistance against major drug classes, including NRTIs, NNRTIs, and integrase inhibitors. Drug toxicity, metabolic complications, and interactions with other medications remain major concerns, affecting adherence and long-term treatment success.

Drug Therapy for HIV/AIDS

The cornerstone of HIV treatment is Antiretroviral Therapy (ART), which uses a combination of drugs to suppress viral replication and improve immune function. Major drug classes include:

- NRTIs (e.g., zidovudine, lamivudine): inhibit reverse transcriptase enzyme
- NNRTIs (e.g., efavirenz, nevirapine): directly block reverse transcriptase
- Protease inhibitors (e.g., ritonavir, lopinavir): prevent viral protein maturation
- Integrase inhibitors (e.g., dolutegravir): stop viral DNA integration
- Entry/Fusion inhibitors (e.g., enfuvirtide): block viral entry into host cells

Highly Active Antiretroviral Therapy (HAART) involves combining at least three drugs from different classes, which reduces viral load, improves immunity, and minimizes resistance.

Antiretroviral Drug Reference Table

Drug Class	Drug Name	Dose	Dosage Form	Frequency
NRTIs	Zidovudine	300 mg	Tablet, IV	Twice daily
	Lamivudine	300 mg	Tablet, Oral solution	Once daily
	Abacavir	600 mg	Tablet	Once daily
	Tenofovir	300 mg	Tablet	Once daily

Drug Class	Drug Name	Dose	Dosage Form	Frequency
	(TDF)			
NNRTIs	Efavirenz	600 mg	Tablet	Once daily (night)
	Nevirapine	200 mg	Tablet, Suspension	Once daily ×14 days, then twice daily
Protease Inhibitors	Lopinavir + Ritonavir	400/100 mg	Tablet, Oral solution	Twice daily
	Atazanavir + Ritonavir	300+100 mg	Capsule	Once daily
INSTIs	Dolutegravir	50 mg	Tablet	Once daily
	Raltegravir	400 mg	Tablet	Twice daily
Entry/Fusion Inhibitors	Enfuvirtide	90 mg	Injection (SC)	Twice daily
	Maraviroc	300 mg	Tablet	Twice daily

Combination Therapy (HAART)

Highly Active Antiretroviral Therapy (HAART) involves using at least three drugs from different classes. This reduces viral load, improves immune function, and prevents resistance. A common fixed-dose combination is:

- Tenofovir (TDF 300 mg) + Lamivudine (3TC 300 mg) + Dolutegravir (DTG 50 mg) — Once daily

Challenges in Treatment

- Drug resistance due to poor adherence
- Side effects such as nausea, liver toxicity
- Lifelong therapy requirement
- Accessibility and cost issues in developing countries

Recent Advances

Newer drugs have fewer side effects and improved efficacy. Long-acting injectable ART and ongoing research in vaccines and gene therapy show promise for future HIV management.

Conclusion

HIV/AIDS remains a significant health concern, but advances in antiretroviral therapy have dramatically improved patient outcomes. Early diagnosis and strict adherence to ART are essential to control disease progression and prevent transmission. Continued research, improved healthcare access, and increased awareness are necessary to ultimately eliminate HIV/AIDS.

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