Editorial

Occupationally-Acquired HIV Infection - Role of Occupational Medicine in the Prevention and Management: Challenges and Recommendations

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Human immunodeficiency virus (HIV) is a retrovirus that attacks the body's immune system. In the absence of antiretroviral therapy (ART) treatment, HIV infection can lead to Acquired Immunodeficiency Syndrome (AIDS), the most advanced final stage. HIV/AIDS represents a devastating global public health crisis. In developing countries, this problem is exacerbated by recent, sudden funding cuts from international donor agencies. These cuts disrupt access to ART medicines and prevention services for millions of people with HIV/AIDS worldwide. Based on the 2024 global estimates of 41 million (37–46 million) people with HIV/AIDS, 1.3 million new HIV infections, and 830,000 deaths, these funding reductions could result in an additional 4 to 11 million new HIV infections and up to 3 million AIDS-related deaths by 2030. HIV is a preventable disease. However, HIV transmission is ongoing worldwide[1-3].

HIV TRANSMISSION

HIV is NOT spread through casual contact, nor through environmental factors like air, water, insects, or animals. HIV is transmitted through the exchange of specific bodily fluids: blood, semen, pre-cum, rectal fluids, vaginal fluids, and breast milk from a person with HIV. This commonly occurs through unprotected sex, unscreened blood transfusions, infected mother-to-child, sharing contaminated needles, syringes, or equipment. Accidental occupational HIV transmission also occurs[4,5].

OCCUPATIONAL HIV TRANSMISSION

In any workplace, HIV is NOT transmitted through casual contact, including sharing office equipment, spaces, cafeterias, gyms, or restrooms. HIV transmission can occur through two main routes: (1) Contact between the broken skin or mucous membranes (eyes, nose, or mouth) of a worker and the body fluids or tissue of an HIV-infected person, or (2) Accidents involving contaminated needles or other sharp instruments at a workplace[6,7].

Job Categories of Workplace-associated HIV Exposure:

Category 1: Healthcare industry, including **hospitals, teaching universities, and clinics**. Healthcare workers (HCWs), including nurses, phlebotomists, surgeons, dentists, paramedics, and other medical personnel, are at a high risk of acquiring HIV through needlestick or sharps-related injuries (NSIs)[8,9].

Category 2: Sanitation, solid and medical waste collectors, and housemaids.

Solid waste collectors can be exposed to HIV via accidental needlestick/sharp injuries. Their work includes the collection, segregation, and disposal of various domestic and healthcare waste materials, as well as contaminated sharps, infectious materials, pathological waste, and radioactive waste. In Pakistan, the risk of acquiring HIV is heightened because medical and domestic waste are not adequately segregated. Waste-pickers involve in waste collection hence at high risk of acquiring HIV[10,11].

Category 3: Public Safety, including Police, Correction, and Military Services.

Public safety personnel face a high risk of HIV on the job via needlestick or sharp injuries, cuts, and contact with non-intact skin. Exposure can happen during searches involving contaminated syringes, blood/ bodily fluids at a crime scene, or during a physical altercation. Public safety personnel who are engaged in syringe confiscation or syringe-related arrests are at a higher risk of NSIs or victims of accidents and violence. Public safety workers face a significant risk of exposure to HIV due to high infection rates in prisons and increased contact with high-risk groups. A needlestick injury (NSI) can lead to infection. Public safety personnel face a high, but poorly addressed, occupational HIV transmission via NSIs. There is an urgent need for prevention strategies, including HIV awareness training, to help reduce occupational HIV transmission risk in public safety personnel[12,13].

Category 4. The Beauty Industry- barbers, tattooing, acupuncture, aesthetic clinics.

Beauty industry workers can contract HIV during procedures, tattooing, piercing, manicures, pedicures, if unsterilized needles or razors, or contaminated scissors are shared among clients. The risk of transmission from these procedures is not zero. HIV transmission due to unsafe practices has been reported from Pakistan and linked to HIV outbreaks[14].

OCCUPATIONAL MEDICINE AND SAFETY play an essential role in protecting workers from workplace hazards and ensuring a safe and healthy work environment. It focuses on worker health and safety, including the assessment, prevention, treatment, and control of health hazards (biological, physical, chemical, or psychosocial), as well as implementing policies and programs to prevent workplace accidents and illnesses. This work involves tracking work-related injuries and illnesses, testing risk mitigation measures,

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and implementing safety protocols to ensure a safe work environment. In Pakistan, the Centre for Occupational and Patient Safety (COPS) at the National Institute of Health (NIH) is a pioneering institution for occupational safety, focusing on establishing policies and promoting best practices in healthcare settings[15].

RECOMMENDATIONS – Prevention & Management of Occupationally-acquired HIV

No one is immune. Every healthcare worker must observe universal standard precautions to prevent HIV transmission in their routine work. According to the WHO, each patient undergoing any medical procedure should be considered as a potential carrier of blood-borne pathogens, HIV[16].

Routine overused injections and unnecessary surgeries, regarded as a quick relief, have been reported in Sindh, Pakistan. Communities must be educated about the risks of unsafe injections and unwarranted surgeries. Given the ongoing rise in HIV outbreaks and continuing surge in invasive surgical procedures in Sindh, doctors have a responsibility to refrain from performing avoidable, invasive procedures to safeguard themselves and prevent the accidental transmission of HIV[17].

The healthcare industry is the fastest-growing sector in Hyderabad, Sindh, Pakistan; however, information on the number of hospitals, clinics, and healthcare professionals is not well-documented. The number of healthcare facilities and activities related to waste disposal, as well as worker and patient safety precautions, must be investigated to prevent work-related HIV transmission among workers, their families, and the general public.

For the prevention and management of occupational HIV transmission, all doctors must be familiar with CDC and WHO guidelines, understand HIV and timely treatment regimens, and post-exposure prophylaxis (PEP) to prevent further spread of HIV in the workplace. Both doctors and workers must always adhere to standard precautions by assuming that blood and other body fluids are potentially infectious.

CHALLENGES AND GAPS

HIV/AIDS is a long-term, manageable condition, yet it remains a significant public health challenge worldwide. It presents challenges for: (i) workers, (ii) employers, and (iii) occupational medicine and safety physicians who act as a link between workers and employers, treating, counseling affected workers and participating in the development of workplace HIV/ AIDS prevention policies. With the emergence of new HIV epidemics in Pakistan, there is an urgent need for Occupational Health and Safety Medical Professionals, especially HIV Specialists, in Sindh, Pakistan.

The CDC USA reports that 400,000 needlestick injuries occur annually among healthcare workers in hospitals alone. International research data indicate that public safety personnel, along with sanitation workers and those in the beauty industry, are also at high risk of occupational HIV exposure. Comprehensive research is needed to investigate the prevalence of occupational HIV transmission in public safety (police, military) and Sanitation departments in Sindh, Pakistan, and subsequently develop HIV prevention and mitigation policies to protect workers, their families, and the general public.

Pakistan, has been a hub of many HIV outbreaks since 2018[18]; however, accurate, up-to-date information on HIV/AIDS transmission, biosafety, ART treatment, and prevention strategies is unavailable. In order to increase HIV awareness, widespread, large-scale social media campaigns and HIV awareness seminars in schools, public, and private workplaces are needed and must be encouraged and supported.

The global HIV epidemic has significantly impacted occupational health among workers in high-risk professions. It primarily affects workers in healthcare, public safety, and the beauty industry due to poor safety measures like improper sharps handling and inadequate PPE. Transmission occurs through direct contact with infected blood or body fluids, such as needlestick or sharp injuries. These worker's unique challenges that necessitate targeted interventions. A comprehensive response from both the public and private sectors must include universal standard precautions, robust HIV/AIDS awareness and education programs, and easy access to HIV Antiretroviral Therapy (ART), and post-exposure care, along with mental health support.

With ongoing HIV epidemics in Pakistan, a proactive, multidisciplinary approach to occupational health and safety is essential to protect workers and ensure a safe, productive, and equitable workplace. There is no cure for HIV, but it is a manageable chronic condition.

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