

Assessing HIV, Hepatitis B, and C, Co-Infections among Patients Attending a Tertiary Care Hospital in Karachi: Prevalence, Trends, and Public Health Strategies

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ABSTRACT

Introduction: HIV is the major global burden with approximately 38 million population is suffering with this infection. In sub Saharan region approximately 67% population is affected. The co infection of HIV with HBV and HCV make this infection more complicated and more difficult to treat. In Pakistan 10 million people are living with Chronic HCV infections while the ratio of HBV is 3.9% showing necessitate integration of health care system to combat this co morbidity and mortalities.

Objectives: The aim of this study is to access HIV prevalence, with co infection of HBV, HCV and triple infection of HIV with HBV and HCV simultaneously in patients coming to tertiary care hospital.

Methodology: This cross-sectional study comprised 34,494 suspected HIV patients aged 7 to 60 years from diverse clinics such as, antenatal clinics, OPDs, in wards patients, dialysis unit, dental, and pre-surgical patients with no restrictions on ethnicity in a tertiary care hospital in Karachi between June 2024 and June 2025. The Confirmed HIV Positive samples underwent further testing for for hepatitis B (HBV)antigens HBSAg and hepatitis C (HCV)Antibody. The viral markers were checked by using technique called Chemiluminescent Immunoassay (CLIA) technique on a Diasorin FDA-approved analyzer. The CLIA uses enzyme-labeled antibodies that interact with a chemi luminescent substrate, producing light proportional to the analyte concentration, allowing highly sensitive and specific detection of antigens and antibodies in patient samples. This study estimated co-infection rates of HBV, HCV among confirmed HIV-positive patients, with CLIA technique. The CLIA has a superior sensitivity and specificity compared to other methods such as immunochromatographic tests and ELISA.

Key Findings: Out of 34494 patient's HIV Positives cases were 308(0.89%). Comprising 22 % females and 78%males in total HIV positives cases. Among HIV positive patients, HBV coinfectd patients were 2.92% (9/308) and HCV coinfectd with HIV were found 12.66% (39/308) while triple infection HIV,HBV,HCV were found 1.62%(5/308).This data highlights elevated rates of HCV coinfection compared with previous studies in Pakistan predicting high burden of Viral infections in high risk group.

Conclusion: It is needed to Strengthen collaborations with community organizations to boost awareness among high-risk groups population. Training for healthcare and lab staff on infection control, safe injections, and biosafety protocol is need of time. Implement harm reduction initiatives, such as reuse of needle exchanges and opioid substitution therapies system implementation and Deploy electronic health records to monitor co-infection rates in population and ensure seamless care continuity. Advance local research into epidemiology, vaccines, and resistance profiles to shape public health responses. Upgrade surveillance systems for swift outbreak detection and trend analysis of co- infection. There is need of policy to implement IHR,GHSA mandate for safe healthy future in the community.

Keywords: Hepatitis, Co-infections, ELISA, CLIA, Prevalence.

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