

Implication of COVID-19 in patients of HIV with hepatitis C

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ABSTRACT

HIV with coexisting Hepatitis C infection has been a global health problem. HIV with Hepatitis C prevalence is significantly higher in people living with HIV. These patients being immunocompromised are at higher risk of contracting COVID-19 infection. Super added COVID-19 infection may prove to be fatal in these patients. We decided to review literature for assessing the clinical manifestations and management of these patients contracting COVID-19 infection and explore the public health measures in practice in the current scenario. Practices of safety norms against COVID-19 shall prevent associated health morbidity and mortality. Moreover, management of these patients needs to be judiciously done by Physicians as COVID-19 infection may worsen their condition. The Public Health Specialist are playing a crucial role in management of COVID-19 pandemic especially by strategy planning for surveillance, health education and preparedness for any future wave of COVID-19 infection.

Keywords: Antiretroviral therapy, COVID-19, direct-acting antiviral (DAA), Hepatitis C virus (HCV), human immunodeficiency virus (HIV), mortality, Sub Saharan Africa

Background

HIV (human immunodeficiency virus) with coexisting Hepatitis C infection has been a global health problem. There are around 170 million patients of Hepatitis C and 330 million patients with HIV positivity worldwide. In India, an estimated 23.48 lakh people were living with HIV (PLHIV) in 2019 with an estimated incidence rate of 0.05 per 1,000 uninfected populations.^[1] Global estimate of 2019 revealed that around 0.7% [0.6-0.9%] of adults in age group of 15–49 years were HIV positive cases.^[2] The Hepatitis C Virus (HCV) and Hepatitis B Virus (HBV) infection prevalence in Africa is the second highest in the world. HIV infection has led to increased health care burden

worldwide. The prevalence of HIV with co-existing HCV which is blood-borne is also significantly higher in sub-Saharan Africa and Asia but lesser as compared to western counterpart such as USA and Europe.^[2] The common blood-borne routes of these infections are responsible for such coexistence of HIV with HCV diseases. The HIV with HCV infections has been commonly encountered in high-risk individuals such as those sharing needles during drug abuse, those receiving frequent blood transfusion (ex-patients of hemophilia), frequent blood donors, infants born to mothers having HCV infection, those habitual of frequent tattooing, salon goers may get infected due to use of infected blades, sharing common commodes in washroom may get infected due to bloodstains on seat of commode etc.^[3] Management of HIV with HCV infected patients are now been carried out globally by health care workers due to dedicated initiatives of government health organization and health agencies in administering antiretroviral therapy for HIV and Directly Acting Anti-Viral Drugs for HCV infections. Antiretroviral therapy and other necessary medications are being

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judiciously given to patients of HIV in Africa as well as globally but morbidity and mortality in HIV patients co-infected with HCV are found to be higher.^[3,4]

Moreover, patients with co-morbidities such as cardiovascular diseases, hypertension, cancers, diabetes, HIV, hepatitis, diabetes, and chronic illness are at higher risk of developing COVID-19 (Synonym: Corona Virus Disease of 2019) infection. HIV with HCV infections are an immune-compromised state. If these patients of HIV with HCV get infected with COVID-19 the course of disease may manifest with severe manifestation and complications and may increase mortality rates in these patients.^[5] As HIV/HCV infections are communicable in nature the community primary care and family physicians have to play a vital role in prevention and care promotion by health educating the family members and community members associated with these patients about the concerned diseases, nature and routes of transmission, needed preventive measures to be practiced and availability of anti-retroviral therapy for recovery. This will help in removing social stigma associated with these infections as well but also enthruse the family members and associated community members for having compassionate dealing with these patients. Moreover, the health education by community health workers regarding COVID-19 risk and adoption of suitable preventive measures will help in prevention of occurrence of severe COVID-19 manifestations in patients of HIV/HCV. And these facts gave us an impetus to explore the literature for the recent research works which were conducted for investigating the clinical manifestations, adapted public health preventive measures and management of patients of COVID-19 with pre-existing HIV cum HCV disease; in the Pub Med and Med Line databases after the advent of this COVID-19 pandemic.

Discussion

COVID-19

COVID-19 is the coronavirus disease 2019 and is so named due to the advent of this disease as result of the outbreak which originated in Wuhan city of China in the year 2019. This disease is caused by Severe Acute Respiratory Syndrome COV 2 Virus (SARS COV 2). The critical manifestation of this disease is the Acute Respiratory Distress Syndrome leading to severe fall in oxygen saturation (SPO₂) level. This need urgent oxygen support and further patient may be needed to be put on ventilator support for breathing. The fulminating rapid spread with occurrence of pneumonia, arterial and venous thrombosis and thromboembolism is life threatening in the COVID-19 patients.^[5] More than year and ten months now the world is still witnessing severe second wave and few anticipating the third wave of this pandemic with advent of the mutant strains. The vaccine against COVID-19 is still yet to prove its efficacy against all these mutant strains leading to higher morbidity and mortality globally which continued till September 2021 but there after a flattening curve is being observed in many countries. The recent second wave which commenced in April 2021 in India has assumed to the stage of community spread and management was really challenging in such a populous country.

The Severe Acute Respiratory Distress Syndrome as evident in second phase needed urgent oxygen support and patients were dying due to lack of adequate health resources such as adequate number of oxygen cylinders, ventilators and sufficient number of hospital beds.^[6] The second wave of COVID-19 second has been devastating with increase mortality rate in India. Anticipating third wave of COVID-19 in India it is necessary that we be well prepared to manage such situation. Moreover managing immune-compromised patients such as HIV with HCV infection apart from other health burden diseases such as Tuberculosis or Malnutrition in this COVID-19 pandemic is a challenge and all preventive measures should be taken towards preventing these immune-compromised patients from contracting COVID-19.

Hepatitis C

Hepatitis C infection is caused by Hepatitis C Virus. The infection spreads through blood routes and is commonly seen in individuals who may get infected while using shared needles especially the intravenous drug abusers, transfusion of infected blood, unsafe sexual practices, in individuals sharing shaving blades, individuals tattooing or sharing western commode lavatories. The common signs and symptoms associated with HCV include fatigue, loss of appetite, drowsiness, easy bleed, bruising, yellow discoloration of sclera and skin, ascites, and spider angiomas. The complications associated with HCV include hepatocellular carcinoma, cirrhosis and hepatic failure.^[7] It was observed in Clinical studies that only 25% of all transfusion was attributed to HBV while the remaining was grouped under Non-A-Non B hepatitis. It was the effort of Harvey J. Alter, Michael Houghton, and Charles M. Rice the three Noble Laureates of Physiology and Medicine of 2020 who discovered the Hepatitis C Virus.^[7] The diagnostic procedure which has been developed over the years by these three Noble Laureates will help in earlier diagnosis of HCV and prevent incidence of hepatocellular carcinoma. The anti-viral vaccine against HCV can now be designed. Vaccination against HCV and HBV can now help in eliminating all transfusion-associated hepatitis. The cause of concern is the increase prevalence of HIV/HCV co-infection. Nearly 25% of HIV patients have HCV infection in the United States of America.^[3,8]

Moreover, if these HCV patients who are in immune-compromised states contract COVID-19 infection they will have severe morbid manifestations of COVID-19 and mortality rate may increase. Hence all health workers managing such patients should be cautious while eliciting their treatment history for HIV and HCV and ensure that if these patients are COVID-19 antigen positive, then symptomatic treatment and confirmation of chest CT for any lung pathology such as pneumonia should be carried out, injection of anti-viral remdesivir may be administered as well as careful monitoring for any signs of thrombosis and if required suitable anti-coagulant such as Low Molecular Weight Heparin can be started in these patients.^[9,10]

HIV

Acquired immunodeficiency syndrome (AIDS) is caused by the HIV virus. The immunodeficiency in this condition leads

to an immunocompromised state which increases susceptibility to various infections. The lowered CD4 cell count with decreased T4 helper cell activity lowers the immunological defense. The common infections associated with HIV are pneumocystis pneumonia, cryptococcal meningitis, candidiasis, tuberculosis, cytomegalovirus infection and toxoplasmosis. Moreover, Lymphoma and Kaposi Carcinoma had been commonly associated with HIV.^[3,7] The cause of concern is severe manifestations and increased mortality in patients of HIV contracting COVID-19 as these patients are already in compromised state as well as pneumocystis pneumonia being a very commonly encountered manifestation in HIV patients; the lung pathology may get worsened due to superseding COVID-19 infection which may manifest with severity and critical occurrence of Acute Respiratory Distress Syndrome.

Another point of concern is the new undiagnosed cases of HIV and HCV who are needing diagnostic and therapeutic assistance and are unable to receive it due to hospitals and health workers being engaged in managing COVID-19 pandemic as the first priority. In addition to above pandemic has affected the mental being in the community and promising sexual behaviors in adolescent age group such as unprotected sex, intravenous drug abuse, and practices of homosexuality may land up more newer patient of HIV and HCV infection in community and tragedy is that they may not receive adequate health assistance especially at time of pandemic. The commercial sex workers in quest for livelihood during pandemic can become a source for HIV infections. Patients of HIV with HCV infection or even undiagnosed patients of HIV and HCV both of these group are at higher risk of contracting COVID-19 and if so severe manifestation of COVID-19 in these patients cannot be ruled out.

Hepatitis C and HIV prevalence

There have been 1.34 million deaths due to viral hepatitis and 1.3 million due to HIV. Nearly 25.7 million Individuals are infected with HIV in sub-Saharan Africa. There are 0 million individual having HBV and 10.2 million having HCV infection here. In South Africa 7.9 million people were identified of having HIV in 2017. The South Africa's National Hepatitis Guidelines and Action Plan have targeted to eradicate hepatitis by the year 2030.^[3,8]

Mortality risk in COVID-19 patients infected with HIV or those with HIV and co-existing HCV infection

Research studies have pointed out higher COVID-19 mortality in people living with HIV infections. This increased mortality is attributed to higher comorbidities burden in patients of HIV as well as the social determinants of health play role in this scenario.^[9,10] The death in HIV patients was more due to existing co-morbidities and anti-retroviral therapy does not provide any kind of protection from COVID-19 disease acquisition, prognosis or mortality.^[11]

Mangia A, *et al.*^[12] have observed that the prevalence of HCV antibodies in COVID-19-infected patients was comparable as with the general population in Italy. The HCV patients manifesting metabolic cirrhosis had higher mortality rates, while HCV antibodies were suggestive of "protection" against COVID-19. Hence the authors opined that the HCV patients are less likely to develop severe COVID-19 infection.

While Bhaskaran K, *et al.*^[13] investigated the associate risk of death due to COVID-19 in HIV infected patients and opined that there is higher risk and statistically sex hazard ration was determined to be 2.90 (95% CI 1.96-4.30; $P \leq 0.001$).

Similarly Ssentongo P, *et al.* had conducted a meta-analysis about epidemiology and outcome of COVID-19 in HIV infected individual and opined that people living with HIV are at higher risk of contracting COVID-19 infection and are having higher risk for mortality.^[14]

Role of public health specialist in COVID-19 first and second outbreak in India

The Public Health Department planned stringent protocol in which Primary Care and Community Medicine department of all Government colleges as well as private medical establishments in conjunction with rural health centers and primary health centers worked round the clock in management of COVID-19 cases, health education as well as health care via telemedicine mode for preventing community spread of COVID-19 infection as well as facilitated testing for SARS COV 2 for the community members. The efforts of community health workers in target testing and contact tracing during first and second wave of COVID-19 in India was laudable. The public health department also created hot spot mapping of various geographical area across the country for targeting and tailoring effective control strategies. The public health department is now active in vaccinating public with COVID-19 vaccines. All these efforts have also reduced COVID-19 infection risk in patients of HIV, HCV or HIV/HCV co-infected.

Management of patients of COVID-19 with pre-existing HIV and HCV infection

Non-availability of drugs, bifurcation of health systems priorities as well as poor access to health care facilities especially for those residing in hilly, tribal and rural areas is worsening the health of patients of HIV, hepatitis and other sexually transmitted disease in the present pandemic of COVID-19. Preventive and promotive public health services in the present scenario will be helpful in managing the health risk in HIV with co-existing HCV patients and these include:

1. All diagnosed patients of HIV, HCV and HIV with co-existing HCV should follow safety norms of COVID-19 meticulously. Social distancing, use of face mask and hand hygiene is recommended for preventing these patients from contracting COVID-19 infection.
2. If patients of HIV, HCV and HIV with co-existing HCV need some health counseling or treatment they should prefer telemedicine services for consultation.

3. If patients of HIV or HCV report for anti-retroviral treatment or direct-acting antiviral (DAA) therapy they should follow all safety norms against COVID-19 meticulously.^[3,7]
4. The government health agencies should ensure that treatment and follow up of patients with HIV or HCV and HIV with co-existing HCV should continue unhindered even if priority of managing COVID-19 is warranted.
5. If patients of HIV or HCV and HIV with co-existing HCV contract COVID-19 infections careful monitoring of these patients must be carried out. Monitoring SPO₂ levels, CT chest to ensure any progressive pulmonary complications, anti-viral drugs administration as well as looking signs of thrombosis and other associated complications is recommended.
6. COVID-19 Vaccination in patients of HIV or HCV and HIV with co-existing HCV may provide immune-protection against HIV as COVID-19 Vaccination in concurrence with treatment for HIV and HCV outweighs risk if any due to side effects of COVID-19 vaccination.^[11]
7. Involvement in creative activity like book reading, reading of newspapers, religious books and watching television may help patients outweigh anxiety and depression as associated with COVID-19 pandemic lockdown and restriction on social gathering. Outburst of sexual promising behaviors and indulgence in unprotected sex or drug abuse is needed to be avoided in the psychological loom being created by COVID-19 pandemic and moreover this shall prevent occurrence of HIV and HCV infections.

Thus practices of preventive measures shall prove to be immensely helpful in patients of HIV, HCV and HIV with co-existing HCV infection with morbidity and mortality of COVID-19. Moreover we recommend further research studies and clinical case reports disseminating information centered towards management of in larger population of patients of HIV with co-existing HCV contracting COVID-19 infections.

The novelty of our review is the highlighting of associated risk and complications in patients of HIV, HCV or HIV/HCV co-infected patients for severe COVID-19 infection manifestation. This review has also specially discussed the preventive measures and needed practices to be employed by Primary Care and Community Physician for future surveillance and preparedness against similar mutant strain infection.^[15]

Conclusion

The key points addressing the issue of higher risk in patients of HIV, HCV, HIV/HCV co-infected are herewith summarized in conclusion. HIV with co-existing HCV infection is cause of global health concern. Immunodeficiency status of patients of HIV with co-existing HCV poses these patients with higher risk of developing COVID-19 infections. The severity of COVID-19 in patients of HIV with co-existing HCV infection is life threatening as these patients have other existing co-morbidities too. Practices of safety norms against

COVID-19 shall prevent these patients from contracting COVID-19 disease. This will also prevent associated health morbidity and mortality. COVID-19 vaccination outweighs benefits over side effects. Management of these patients needs to be judiciously done by Physicians as complication associated with COVID-19 infection may have poor prognosis. The primary health care and family physician are playing a crucial role in management of COVID-19 pandemic especially by strategy planning for surveillance, community health education and preparedness for any future wave of COVID-19 infection as well as are engaged in COVID-19 vaccine immunization program to ensure that all in community are preferably immunized. The Public Health Specialist have special onus to take care of especially they have to meticulously monitor the long term epidemiologic trends and evolution of SARS-CoV-2 virus as well they are needed to substantially contribute towards the understanding of the co-circulation of SARS-CoV-2 virus in the environment.^[16]

The take home message is that the Community Health Workers should health educate the public for practicing preventive measures such as social distancing, hand hygiene, wearing of mask and isolation in case of infection to prevent contracting COVID-19 infection. The Community Physician should actively participate in COVID-19 Strategic Preparedness and Response Plan (SPRP) for 2021 following the recommendation of World Health Organization for complete control of the pandemic.^[16]

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Conflicts of interest

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References

1. Indian HIV Estimates 2019: Report. HIV surveillance. Available from: http://naco.gov.in/sites/default/files/Facts_figure_page.pdf. [Last accessed on 2021 Oct 16].
2. Global Health Observatory (GHO) Data. Prevalence of HIV among adults aged 15-49 (%). Available from: <https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv/strategic-information/hiv-data-and-statistics>. [Last accessed on 2021 Oct 16].
3. Scheibe A, Young K, Versfeld A, Spearman CW, Sonderup MW, Prabdial-Sing N, *et al*. Hepatitis B, hepatitis C and HIV prevalence and related sexual and substance use risk practices among key populations who access HIV prevention, treatment and related services in South Africa: Findings from a seven-city cross-sectional survey (2017). *BMC Infect Dis* 2020;20:655.
4. Rockstroh JK, Mocroft A, Soriano V, Tural C, Losso MH, Horban A, *et al*. Influence of hepatitis C virus infection on HIV-1 disease progression and response to highly active antiretroviral therapy. *J Infect Dis* 2005;192:992-1002.
5. John N, John J. Implications of COVID-19 infections in sickle cell disease. *Pan Afr Med J* 2020;36:81.
6. Pandey V, Nazmi S. Covid-19 in India: Why second

- coronavirus wave is devastating. Available from: <https://www.bbc.com/news/world-asia-india-56811315>. 20th April 2021. [Last accessed on 2021 Oct 16].
7. Chen TY, Ding EL, Seage GR III, Kim AY. Meta-analysis: Increased mortality associated with hepatitis C in HIV-infected persons is unrelated to HIV disease progression. *Clin Infect Dis* 2009;49:1605-15.
 8. Al-Mahtab M, Roy PP, Khan MSI, Akbar SM. Nobel prize for the discovery of hepatitis B and C: A brief history in time. *Euroasian J Hepatogastroenterol* 2020;10:98-100.
 9. Hadi YB, Naqvi SFZ, Kupec JT, Sarwari AR. Characteristics and outcomes of COVID-19 in patients with HIV: A multicentre research network study. *AIDS* 2020;34:F3-8.
 10. Brown LB, Spinelli MA, Gandhi M. The interplay between HIV and COVID-19: Summary of the data and responses to date. *Curr Opin HIV AIDS* 2021;16:63-73.
 11. Johnston R. The first 6 months of HIV-SARS-CoV-2 coinfection: Outcomes for 6947 individuals. *Curr Opin HIV AIDS* 2021;16:54-62.
 12. Mangia A, Cenderello G, Verucchi G, Ciancio A, Fontana A, Piazzolla V, *et al*. Is positivity for hepatitis C virus antibody predictive of lower risk of death in COVID-19 patients with cirrhosis? *World J Clin Cases* 2020;8:5831-4.
 13. Bhaskaran K, Bacon S, Evans SJ, Bates CJ, Rentsch CT, MacKenna B, *et al*. Factors associated with deaths due to COVID-19 versus other causes: Population-based cohort analysis of UK primary care data and linked national death registrations within the Open SAFELY platform. *Lancet Reg Health Eur* 2021;6:100109.
 14. Ssentongo P, Heilbrunn ES, Ssentongo AE, Advani S, Chinchilli VM, Nunez JJ, *et al*. Epidemiology and outcomes of COVID-19 in HIV-infected individuals: A systematic review and meta-analysis. *Sci Rep* 2021;11:6283.
 15. Melvin SC, Wiggins C, Burse N, Thompson E, Monger M. The role of public health in COVID-19 emergency response efforts from a rural health perspective. *Prev Chronic Dis* 2020;17:E70.
 16. WHO-2019-nCoV-SurveillanceGuidance-2020.7-eng.pdf. Available from: <file:///C:/Users/dr%20nitin%20ashok/Downloads/WHO-2019-nCoV-SurveillanceGuidance-2020.7-eng.pdf>. [Last accessed on 2021 Oct 16].