

HIV and COVID-19 Comorbidity: Current Evidence

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ABSTRACT

The spread of the COVID-19 has now crossed all known human borders with so much virulence and defiance to the acclaimed international efforts aimed at mitigating its impacts. The emergence of this disease in December 2019 at Wuhan in China has left the world in tatters; with collapsed national economies, massive loss of jobs and sources of livelihoods, a redefining of social ethics and concourse, and a restructuring of the ethos that guide our national ways of life. The increased risk of severe disease with COVID-19 is closely associated with advanced age (>50 years), male gender, hypertension, diabetes, Chronic Obstructive Pulmonary Diseases, Cardiovascular diseases, and Cerebrovascular diseases. People Living With HIV are most prone to increased morbidity, and the advent of the COVID-19 has now created an additional comorbid burden on the over 37.9 million PLWH globally. There is no known cure or effective treatment for COVID-19 as at yet, but there are promising therapeutic alternatives. People Living With HIV stands a better chance of a positive disease outcome when infected with COVID-19 provided their viral load is suppressed, if they are on an active HIV Antiretroviral Therapy, if they have a high CD4 T-helper cells counts (>200 cells/ μ L), and provided they have no underlying chronic diseases conditions. Some studies have shown that a dysregulated immune response might be responsible for conferring some level of protection against the SARS-CoV-2 virus infection in HIV patients. Thus, the disease outcome of People Living with HIV who are co-infected with the SARS-CoV-2 virus is no different from the prognostic outlook of any averagely healthy individual infected with the SARS-CoV-2 virus without any underlying chronic health conditions.

Key Words: COVID-19, SARS-CoV-2, HIV, Comorbidity, PLWH

1. INTRODUCTION

When the first incidence cases of the Coronavirus Diseases 2019 (COVID-19) emerged at Wuhan China in early December 2019, the world was still in a state of slumber; not knowing the marauding impact of what was coming. As tale bits of news begins to filter into main stream media and the internet about a novel strain of Coronavirus rampaging China from late January 2020, the world became alert and suddenly woke up into a nightmare of epic proportion. Social life and the ingrained idea of personal liberty and freedom has not being the same ever since, and this is coupled with the crumbling of the world economies, loss of jobs, and a monumental toll on the mental health of individuals. Medical Experts all over the world by merely observing the virulence nature and the case fatality rate of this novel disease knew what was coming, however, the WHO held that this was not a pandemic until March 11, 2020. ^[1] The COVID-19 has however being transmitted to at least 213 countries ever since, leading to the complete shutdown of cities, human social activities and entire nations. Bringing social and economic activities to a standstill while still marching on with the defiance of an all-conquering master. Nevertheless, the world will overcome this common enemy with a common resolve, cooperation and mutual efforts. COVID-19 is a viral respiratory disease that causes severe Pneumonia. As at June 12, 2020, over 7.5 million COVID-19

cases have been reported globally with over 422 thousand deaths and over 3.5 million recoveries. [2] Due to the rapid spread of this disease and the very high mortality rate associated with it, it is imperative that the comorbidities and the associated risk factors that may predicate the clinical outcome of this disease be clearly established as this may help guide the clinical and palliative management of this disease. Studies have shown that comorbidities in COVID-19 patients may lead to poor prognosis. [3-4]

Due to the novel nature of COVID-19, many facts about the nature of this disease are still emerging. Several studies to establishing its risk factors, comorbidities, possible choice of chemotherapy, and the development of an appropriate vaccine against the COVID-19 strain is still ongoing. Due to the case fatality rate of this disease, it has been associated with several comorbidities that forms a cluster of chronic health conditions. [3, 5-10] HIV is a chronic disease condition associated with immunosuppression, thus the emergence of COVID-19 now create an additional burden of disease for the over 37.9 million People Living with HIV (PLWH) globally. [11] Case series of COVID-19 infection in HIV patients have been reported from China, Europe, and the United States, [12-15] but thus far, the disease progression and outcome in this group of patients have not been different from those of HIV Negative individuals. [12-15] This review seeks to establish the low risk associated with the comorbidity of HIV and COVID-19 in light of available evidence.

2. COVID-19 and Chronic Health Conditions

The advent of the COVID-19 has let loose a plethora of underlying chronic health conditions in affected individuals. The comorbidity of this underlying chronic health conditions and COVID-19 has significantly increased the Odd Ratio (OR) of affected patients having a poor COVID-19 infection outcome. [9] Several meta-analytical studies on COVID-19 comorbidities have revealed the poor

disease outcome and increased case fatality rate among COVID-19 patients with underlying chronic disease conditions like Hypertension, Diabetes, Cardiovascular diseases, Cerebrovascular diseases, and Chronic Obstructive Pulmonary Diseases (COPDs). [3, 7-8, 10, 16] In the pooled analysis of 1558 COVID-19 patients from 6 studies, Wang, et al. [3] finds no correlation associated with comorbidity risk among COVID-19 patients with malignancies, liver diseases or renal diseases; instead, they find major risk factors associated with hypertension, diabetes, cardiovascular diseases, and COPDs. Diabetes Mellitus (DM) have been distinctively associated with more severe COVID-19 case fatality and increased mortality rate. [17] In addition, as older adults (>50 years) have been increasingly associated with poor prognosis of COVID-19, DM can be presumed more likely to be prevalent among the older population than among the younger population; this may partly explain the underlying cause of the increased case fatality among the adult population. [17] Other studies have also shown a high prevalence of Cardiovascular Diseases among COVID-19 patients. [5-6, 8] Yang, et al. (2020) has also reported that the most common COVID-19 comorbidity associated with increased mortality among COVID-19 non-surviving patients is cerebrovascular diseases and Diabetes. [8]

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Due to the compromised immunity of PLWH, such patients are most prone to morbidities. Thus with the advent of the COVID-19 pandemic, the morbidity burden on PLWH has increased. Our current knowledge indicates that older adults (>50 years), male gender, those with underlying chronic diseases conditions and with compromised immunity stands a greater chance of more severe COVID-19 infection prognostic outcome with increased fatality and mortality rates. Available data from different studies have however excluded PLWH without any other underlying

chronic health conditions from this high-risk population, provided they are on ART with a reasonably high CD4 T-helper cells count (>200 cells/ μ L).^[12] Studies have shown that in PLWH, a dysregulated immune response to the SARS-CoV-2 infection leads to a delayed plasma antibody production against the COVID-19 virus and a lack of inflammatory changes with no clinical symptoms elicited after infection with the virus.^[18-19] According to a report by Joob and Wiwanitkit (2020), PLWH who are not on HIV Antiretroviral Therapy (ART) are at increased risk of developing a more severe form of the COVID-19.^[13] However, PLWH who are currently on the standard ART regimen and whose CD4 T-helper cells are >200 cells/ μ L without any underlying chronic diseases conditions will have better prognostic outcome as comparable to other averagely healthy SARS-CoV-2 infected individuals without any underlying chronic diseases conditions.^[13] Some researchers have presumed the possibility of the standard anti-HIV drugs being able to proffer a protective mechanism against the SARS-CoV-2 infection in PLWH.^[13, 18] However, a large countrywide survey in China has shown that such standard anti-HIV drugs like Lopinavir/Ritonavir though largely publicized, as a possible wonder drug against the COVID-19, may not really be of much benefit to COVID-19 patients.^[20] Thus at a time like this, it is imperative that we encourage PLWH to religiously adhere to their ART regimens, ensuring their viral Load is suppressed, while also dispensing to them prophylactics against Opportunistic Infections (OIs).^[12]

4. COVID-19 Treatment

As the race to finding a cure for the COVID-19 intensifies, the WHO is leading the charge in a global effort aimed at harnessing a solid treatment data that could help proffer the way forward in the midst of this current global conundrum.^[21] Several possible drugs are currently undergoing randomized control trials at different parts of the world in a bid to assessing their

efficacy at treating COVID-19. Such drugs include the famed Hydroxychloroquine with or without Azithromycin, and Chloroquine, which has not been well proven as at yet to be effective against the COVID-19 infection in the face of other complicated adverse effects.^[22] Other drugs undergoing trials include the HIV drug Lopinavir/Ritonavir, which has also been proven not to be effective in the treatment of COVID-19. Other promising drugs currently being tested include the failed Ebola drug, Remdesivir and Famotidine which has so far shown possible signs of efficacy based on the COVID-19 survival rate of clients on these drugs as compared to those clients on Placebo.^[12,21] Several other efforts are being made at developing an active vaccine against the SARS-CoV-2 virus. Efforts are also under way at identifying the specific antibodies produced against the SARS-CoV-2 virus from the plasma of convalescing or recovered COVID-19 patients. It should also be noted that PreP treatments have not shown any effectiveness against COVID-19 recovery.^[12]

5. HIV Services during the COVID-19 Pandemic

Due to the global shutdowns, lockdowns, social distancing, and the total restriction of movements occasioned by the COVID-19 Pandemic, many of the gains made at mitigating the impacts of earlier pandemic diseases like HIV and Tuberculosis are now being eroded.^[23] The emergence of the COVID-19 pandemic now threatens the achievement of the UNAIDS 90:90:90 targets on HIV. The restrictions on movement have now hampered many HIV/AIDS clients from assessing ART and clinic visits.^[24] Many PLWH are now unable to get their needed Antiretroviral (ARV) drugs refill as at when due as a result of the restrictions on movement which is limited to only personnel on essential duties. In some countries with the rumored efficacy of Lopinavir/Ritonavir against the COVID-19 infection, there has been the steady shortage of this HIV drug because of hoarding by uninformed individuals. The

unavailability of the right ARV regimen and the inability to assessing ARV at the right time could both contribute to a rapid increase in the HIV plasma viremia of PLWH. This could also lead to the development of HIV drug resistance by the HIV RNA because of inadequate, intermittent, or suboptimal drug exposure. In addition, the inability to assessing HIV Testing Services (HTS) at the right time could spell a phase for the rapid spread of HIV. The COVID-19 Pandemic has grossly hampered logistics for the shipment and movements of Public Health Commodities. [25] HIV services and logistics has been generally slowed down with many deleterious effects already hovering if we do not redouble our efforts at reprogramming and strategizing our approaches.

6. Reprogramming HIV Services during the COVID-19 Pandemic

Public Health efforts in HIV services needs to be re-doubled, and a re-strategizing in HIV Programming is now needed in order to maintaining the gains already made in HIV care and services. As different countries begins to ease the COVID-19 Pandemic lockdowns, one obvious facts is that things may not go back to the way they were until a lasting cure or treatment is found for the SARS-CoV-2 infection. With the active spread of COVID-19 and the major collapse of world economies, we must not lose our grip on the major gains made in the fight against the HIV Pandemic. Our strategies must be built around the UNAIDS 90:90:90 targets; hence, in our bid to maintaining the speed and momentum we have gained in HIV Programming, we must urgently intensify our efforts on the following:

6.1 Community HTS Outreaches

In light of the restrictions on movement occasioned by the COVID-19 Pandemic, more Community Outreaches in smaller units now needs to be organized on a regular basis. Large-scale outreaches should be avoided in order to maintaining Social Distancing. Since the people can no longer move freely and at will, we must

now take HTS to the people at their localities especially on “Lockdown-free Days” when the people can have a bit of movement. Because of the economic hardships now created by the COVID-19 Pandemic, people now consider it a priority to looking after themselves and their family sustenance first before considering any other thing. We must now endeavor to taking HTS to people at their business and work places, offering and rendering them our services once they are obliged. We need to now prioritize high-risk groups, and map out strategies to reaching them in clusters. This continued effort will enable us to keeping the pace with the first UNAIDS 90 target.

6.2 Access to ART

Efforts should now be intensified at differentiating PLWH into different Models of Care. Dispensing of ARVs at Community Pharmacy Stores should be intensified. In addition, the Multi-months Dispensing (MMD) of ARVs should be rapidly encouraged. All newly diagnosed HIV Positive clients should be encouraged to commence treatment immediately. Efforts should be made at ensuring the ready availability of ARVs, as shortages or unavailability may lead to undue rationing which may not be convenient for the patients. Regular Health Talks during Clinic visits should emphasise the importance of taking ARV regimens as prescribed and without fail. The danger associated with poor adherence should also be emphasized. Ensuring a free flow of access to ARVs by PLWH and strict adherence to ARV regimens will help in keeping pace with the second UNAIDS 90 target.

6.3 Community Phlebotomy

Provisions should now be made at bleeding PLWH who are eligible for viral load testing at the community level. Clusters of PLWH living in proximate communities can be tracked and mapped into groups for collective ARV refills and HIV viral load Phlebotomy. The use of Dried Blood Spot (DBS) for HIV viral load can greatly help simplify this effort. This effort will help

reduce the challenge of transportation and restrictions placed on movement by governments because of the COVID-19 Pandemic. Moreover, for some PLWH who are afraid of visiting the hospitals because of the possible comorbidity risk associated with HIV and COVID-19, and the possibility of having hospital contact with COVID-19 patients, having their viral load samples taken at the community will come as a great relief. This effort when properly harnessed could help in maintaining the gains made at meeting the UNAIDS third 90 target.

6.4 Enhance Adherence Counselling (EAC)

The essence of carrying out HIV viral load testing for PLWH is to assessing the efficacy of a given ARV regimen and to monitoring HIV viral load suppression. The WHO has defined HIV viral load suppression as an HIV patient having a circulating HIV RNA of <1000 copies/ml; and an unsuppressed HIV viral load as having a circulating HIV RNA of >1000 copies/ml. [26] PLWH with unsuppressed HIV viral load are to be immediately tracked and enrolled into the EAC program. A mandatory HIV viral load re-testing is to be carried out at the end of the EAC program in order to assessing the unsuppression to know whether it is because of non-adherence or because of ARVs failure. The outcome of the EAC should determine the next course of action for such a client.

6.5 Community Support Group Member

The HIV Community Support Group Members (CSGMs) plays a pivotal role in helping to mobilize PLWH in the communities for HIV care and services. This experienced and specialized PLWH should be involved in Community Tracking, ARV mobilization for PLWH in the communities, and mobilization for viral load sampling. As informed members of PLWH in the communities, the CSGMs should serve as the voice and eye of the HIV programs at the community level.

7. CONCLUSION

The emergence of the COVID-19 pandemic in early December 2019 at Wuhan, China, has so far changed some fundamental tenets of the global order, as we know it. Massive global economic down turns, loss of jobs and sources of livelihoods, changes in social structures and a redefining of norms and social exchanges. [27,28] Several chronic diseases conditions increase the risk, case fatality, and mortality rate of the COVID-19 infection. In the midst of the hardships and mental stress caused by this pandemic, chronic diseases such as hypertension, diabetes, COPDs, Cardiovascular diseases, and Cerebrovascular diseases all increases the chances of a case fatality with SARS-CoV-2 infection. [3,5,8] Studies have however shown that with a normal CD4 T-helper cells count (>200 cells/ μ l), and with active ARV regimen with no underlying chronic health conditions, PLWH have similar survival outcome with averagely healthy individuals who are infected with the SARS-CoV-2. Thus, HIV infection comorbidity with COVID-19 does not predispose PLWH to additional risk, provided the HIV viral load is suppressed (<1000 copies/ml) with a normal CD4 T-helper cells count (>200 cell/ μ l). [12] Several drugs are undergoing trials as treatment options against the COVID-19, however, Hydroxychloroquine with or without Azithromycin, Chloroquine, and Lopinavir/Ritonavir have all been proven not to be effective against the SARS-CoV-2 infection. [12, 20, 22] Some of these drugs have also shown a deleterious adverse effect on patients in randomized control trials. Two drugs, Remdesivir and Famotidine are currently been tested for their promising efficacy at increasing the survival chances of COVID-19 patients. [12,22] In addition, a dysregulated immune response to COVID-19 infection seen in PLWH might possibly be conferring some level of protection against the SARS-CoV-2 infection in PLWH. [18-19]

A lot has changed in the HIV care services because of the COVID-19

pandemic; nevertheless, a redoubling of efforts is needed to maintaining the gains so far made in HIV Care Services globally. New HIV programming strategies now need to be devised at reaching PLWH at the community level and at testing HIV exposed populations. Achieving the UNAIDS 90:90:90 targets is a mandate and maintaining the pace and momentum already achieved in HIV care and services will help in improving current efforts aimed at integrating the COVID-19 services into the already existing HIV care services platforms.

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How to cite this article: Segun AD. HIV and COVID-19 comorbidity: current evidence. *International Journal of Science & Healthcare Research*. 2020; 5(2): 349-355.
