Preventing and Treating HIV in Light of COVID-19

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Abstract. The global population as a whole has been hit hard by the COVID-19 epidemic, which has infected 600 million people and caused 6.5 million deaths. The risk of contracting or experiencing severe effects from COVID-19 may be the higher in people with preexisting medical conditions. Despite the apparent hazards of getting sick from or losing loved ones to those infected with HIV, people living with HIV, especially homosexual males and MSM, are affected in unique ways that will endure even after the COVID-19 crisis subsides. Treatment and prevention for HIV/AIDS and their results. Using a comprehensive framework, this paper analyzes how COVID-19 has affected HIV patients, attempts to clarify the differences and parallels between COVID-19 and the HIV pandemic, and concludes with recommendations for future actions that policymakers and healthcare providers should take, so that to provide more theoretical basis for the prevention and control of COVID-19 and AIDS, especially MSM patients.

Keywords: COVID-19, Pandemic, HIV, AIDS, Men who have sex with Men (MSM)

1. Introduction

By September 2022, COVID-19 has infected 600 million people and caused 6.5 million deaths. Since COVID-19 spreads quickly and replicates efficiently, its prevalence can be tracked. People infected with COVID-19 typically become ill. People of advanced age and those already struggling with a medical condition are more vulnerable to disease and premature mortality. This affects the health of COVID-19 patients and others in various countries. The World Health Organization recommends social distancing to decrease the transmission of COVID-19, a CDC approach that has spawned many stay-at-home orders. Self-isolation is costly due to fear, loss and social isolation. With schools closed, many families must meet their children's virtual educational needs [1].

The HIV epidemic remains a challenge. There have been 79.3 million new cases of HIV/AIDS and 36.3 million deaths since the disease was first identified. In 2020, there were an estimated 37.7 million persons infected with HIV. Compared to COVID-19, ART has averted about 1.2 million case-related deaths over the past. When COVID-19 began, HIV was far from eradication, and diverting medical resources from HIV to COVID-19 could further impede progress, or even reverse recent progress. WHO observes that HIV-infected patients may not experience excessive COVID-19 shrinkage due to antiretroviral therapy (ART). Extreme atrophy may occur in HIV-infected patients who are not receiving antiretroviral therapy or who are not receiving adequate therapy. COVID-19, severe symptoms, and death are more likely due to a weakened immune system.

In addition to raising the possibility of COVID-19 consequences, COVID-19 concerns have also impacted people with HIV(PWH). PWH may stop treatment due to distance restrictions that limit non-urgent appointments. There is a proliferation of telehealth options from a variety of providers, but adoption has been gradual and utilization varies greatly. Some PWHs may not use telehealth resources (eg, use of equipment or adequate internet service). PWH may be exposed to COVID-19 when healthcare facilities reopen. PWHs are particularly vulnerable to quarantine due to pandemic-related movement restrictions, a major cause of psychological breakdown [1,2]. Both gay men and MSM have an increased risk of contracting HIV and dying as a result of the disease. About 25% of 2019's new HIV infections were transmitted by MSM. Anti-gay laws and medical care contribute to the stigma that plagues MSM's preventive and treatment efforts. COVID-19 has the potential to

amplify existing HIV treatment and prevention gaps. It is the aim of the COVID-19 research community and medical community that the PWH, and particularly the MSM, can be cured.

This article aims to (1) compare and contrast COVID-19 and HIV; (2) discuss the impact of COVID-19 on PWH prevention and treatment strategies, especially whether the current crisis has a greater impact on MSM;(3) Require doctors and government to reduce the effect of COVID-19 on HIV prevention and treatment [3].

2. The differences and similarities between HIV and COVID-19

The COVID-19 epidemic and the AIDS epidemic are the two major human pandemics experienced in the last 50 years. Both of these viruses are RNA viruses and are transmitted to humans via animals. They have shown great differences in pathological manifestations of symptoms and mode of their transmission. HIV is retrovirus, characterized by a long incubation period and a long duration of illness in patients. It destroys the human immune system by attacking mainly CD4+ T helper lymphocytes, further making patients more vulnerable to opportunistic infections. Comparably, COVID 19 also known as SARS-CoV-2 is positive sense single stranded RNA virus with short incubation period, which can cause acute respiratory infections. However, they also bear some resemblance in crowd fear, stigma and discrimination targeting these diseases and government response [1,4].

2.1. The differences between HIV and COVID-19

The differences between HIV and COVID-19 will mainly be the process of transmission, clinical symptoms, and the prevention and treatment methods towards those two disease.

2.1.1 The mode of transmission

HIV was firstly introduced into humanity in 1980S where it transferred from chimpanzees to humans through direct contact when hunting them for meat. HIV was subtyped for two categories, HIV-1 is the most prevalent subtype among those who get infected while HIV-2 is more generally discovered in West Africa. The major transmission mode for HIV infection is through three mechanisms, which are unprotected intercourse, unsanitized drug injections and mother to child, other possible mechanism includes clinical exposures. Since HIV can not survive outside the human body, normal handshake, hugs, body sweats and daily contact do not infect healthy people [2,4].

COVID-19 was discovered at the end of 2019 in Wuhan province, China. Most of the patients had been involved with close contact in the seafood market, which is generally believed to be a source of the spread. The transmission of the virus is through air, it is proven that droplets of saliva from those infected people and direct contact are the main transmission mechanisms, other researchers also found out the routes of fiscal-oral transmission [1,4].

2.1.2 Clinical symptomatology

HIV infectious stages can be mainly divided into three. The first stage is early infection where patients may develop many symptoms such as fever, body ache, rashes, and swollen lymph nodes which are mild and often being mistaken for regular fever or cold. Next stage is asymptomatic, most people do not develop severe symptoms that cause for special attention and medical alert. The second stage can last for 8-10 years depending on several factors such as life style, general health, environment and etc. As for the final stage, the human immune system has been weakened and damaged with years go by, patients may develop into AIDS period if they are not treated properly. A lot of complications may occur because of the emergency of opportunistic infections such as tuberculosis, salmonella infection, PCP, and Toxoplasmosis [5].

COVID-19 symptoms usually start appearing after 2-14 days after direct contact with the virus, general symptoms include fever, headache, shortness of breath, diarrhea, and muscle pain. With the prevalence of vaccinations and mutations of viruses, most cases only have mild conditions. However people with certain underlying medical conditions, the elderly and pregnant ones are at higher risk of

both infections and mortality, some cases had developed severe symptoms and even experience complications including inflammation of heart, acute respiratory syndrome, sepsis and pneumonia [3].

2.1.3 The prevention and treatment of HIV and COVID-19

With the prevalence of proper sexuality education and available tools, there is a wide range of measures that can help with the prevention of HIV. Safety education for school-age youth is especially critical, common strategies include abstinence, never have unprotected sex, and the drug abuse. Another tool that has proven to be highly effective among high risk people to prevent HIV infection is PrEP(pre-exposure prophylaxis),which can be pills or shots and provide people with more choices to protect themselves. As for those who already have possible exposure to HIV, PEP becomes significant for such emergency situation and needs to be take within 72 hours after a possible exposure [6].

In the early years of discovering HIV treatment, some drugs with high toxicity and resistance were applied, patients had a hard time suffering from side effects. Nowadays, ART (Antiretroviral therapies) has been proven to be high tolerance and less toxic, most importantly it helps to contain HIV viral load undetected and has transformed HIV into a chronic disease [4].

Under the COVID-19 pandemic shadow people seemed to take masks as part of their regular routine, which is also an effective way to prevent droplets and virus spreading. At the beginning of this pandemic outbreak, some HIV treatments such as lopinavir were used but later research has proven its lack of efficacy. With the development of vaccines by major pharmaceutical companies and widespread mass vaccination, the mortality rate has greatly decreased. Some countries even have announced the coexistence of COVID-19.

2.2. The similarities between HIV and COIVD-19

It seems that these two viruses have very different influences and induced diseases, they still have some significant points in common.

2.2.1 Crowd fear in the population

As with any new epidemic, the lack of research and fear of the unknown often leads to crowd fear among the population. HIV can affect anyone despite their social status, race and gender, the lack of an effective cure and the high mortality rate have led to a fear of the virus.

Similarly, COVID-19 was discovered in its early stages due to the lack of an effective cure and high transmission rate, and even many healthy people ended up in respiratory failure due to severe respiratory infections. In addition, the Internet was flooded with rumors and conspiracy theories that caused panic among the population [4].

2.2.2 Targeted discrimination

The lack of effective treatment in the early stages of an epidemic usually causes anxiety and panic, and these negative emotions contribute to a certain degree of disease stigma and target hatred. A corresponding high-risk group will be found among people with existing HIV infection, and people at high risk of HIV infection, such as gay men, are often associated with AIDS-related terms, making some homosexuals more vulnerable in countries where they are already discriminated against.

In the early stages of the COVID-19 outbreak, infected patients were often treated as pathogens, Wuhan and Chinese people were stigmatized and even physically attacked, both within China and in other countries [1,7].

2.2.3 Government response

Global epidemics often require government involvement and policy development to better control the epidemic and reduce mortality rates, and HIV control has been a collaborative effort between government organizations and public health care, with some typical initiatives including the creation of AIDS-themed funds to promote research on related diseases, the establishment of appropriate HIV-

themed health conferences and international charters, and collaboration with UNAIDS to gain access to medication and psychological support for affected populations[1].

COVID-19 shows more direct government intervention in public health measures that have interrupted the spread of the virus, such as social distancing, economic shutdowns, and the introduction of foreign health care workers to keep the health care system up and running. Once again, the government has joined forces with the World Health Organization to ensure that developing countries also have access to vaccines to protect their populations during the universal access phase.

3. What COVID-19 Will Mean for HIV and Vulnerable Populations in the Short and Long Term

COVID-19 has changed global lives. The illness has caused separation and the closure of schools and businesses, disrupting daily life. Due of their social nature, people will keep adapting to COVID-19. Health care practitioners must examine the long-term impact of COVID-19 onHIV patients and healthcare delivery. Adapting to COVID-19 may have biological, psychological, and social effects on PWH [1,3].

3.1. COVID-19's Biological Impact on HIV Treatment

Poorly treated PWH infection and experience are riskier than COVID-19-related consequences, and these risks are greater than those associated with the course of HIV illness. Given the long-term prognosis, PWH must adhere to treatment and keep frequent doctor appointments. The order to stay home may affect PWH treatment, though. In China, many doctors have canceled in-person appointments to comply with policy. Telehealth services are limited, therefore PWH may not have full access to HIV treatment services. Some PWH in rural locations may be unable to access correct local medical services or telemedicine due to uneven distribution of medical resources and inadequate knowledge of telemedicine, which may hamper their treatment progress [1,8].

3.2. COVID-19's impact on HIV treatment's mental health

The enormous COVID-19 outbreak has caused widespread worry. People with chronic health disorders, such as HIV, may have more extreme stress responses. A weakened immune system increases susceptibility to COVID-19. Stress might lead to maladaptive coping techniques like drinking more during an outbreak. Drinking alcohol daily increases the risk of death and alcohol-related health problems among PWH. This risk is greater than among HIV-negative people. PWH's immunity to HIV and COVID-19 is weakened by alcohol use. According to the World Health Organization, alcohol usage increases the risk of health problems. PWH consumption raised viral load. Alcohol impairs judgment, such as during sexually dangerous activity. PWH can transmit HIV via unprotected sex if they participate in risky behavior and have a high viral load. Isolated partners may be more sexually active. Those PHWs with uncontrolled viral loads who don't practice safe sexual conduct (using condoms, for example) or whose sexual partners don't get pre-exposure prophylaxis may be at risk (PrEP). There is evidence that alcohol can amplify the negative effects of mood disorders. [1,8,9].

3.3. Influence of COVID-19 on HIV Treatment in Society

As COVID-19 grows over the world, health organizations have generally agreed on physical separation guidelines, such as a two-meter buffer zone. In the Chinese context, the CDC recommends restricting interactions with individuals outside the home and travel to vital jobs (such as going to work or going to the grocery store). Many governments have issued forced stay-at-home orders, however restrictions vary by country and region [1].

Physical separation standards are important for physical health, not social and emotional wellbeing. PWH may avoid physical interaction. This is particularly true for PWH who have recently been diagnosed and have little background information about HIV. Friendships might be difficult to

maintain for PWHs who are unable to communicate online with their peers. Like everyone else, PWH may spend more time on social networking sites like Facebook and Twitter to make and maintain relationships. Emotional connection via social media may be detrimental to one's happiness, mental health, and perception of one's own health. [1,9-11].

Since many PWHs are marginalized, there are societal ramifications. PWH are at heightened risk and their domestic arrangements can be unsafe or violent; People who lose their jobs, are underemployed, or are laid off as a result of COVID-19; people who are homeless or unstable owing to preexisting problems or COVID-19; and people who have to rely on external sources to survive a pandemic have less access to the medicines typically purchased on the street via needle exchange programs, which are crucial for HIV secondary prevention. There are additional societal ramifications for rural and distant places with inadequate internet connectivity or weather-dependent data plans. PWHs will confront numerous unforeseen obstacles if international borders are blocked and they are separated from their partner or family [1,9-11].

3.4. Consequences of the 19th coronavirus outbreak for homosexual men and other men who have sex with other men (MSM)

Santos et al. from UCSF carried out the research. A cross-sectional study of homosexual men and MSM with a total sample size of 2732 questioned questions in terms of how many people were affected by COVID-19 and how it affected the economy, mental health, HIV prevention and treatment, and so on. A little under half of MSM gay men and other men have difficulty affording mental health care, housing, transportation, and HIV testing and treatment. By causing a disproportionate amount of harm to LGBT subgroups who are undergoing HIV therapy, COVID19 is contributing to the worsening of health disparities as well as socioeconomic inequality. Discrimination against vulnerable groups existed before the pandemic, and it has only gotten worse since then. It is crucial to keep an eye on COVID-19 among homosexual men and other MSM to better understand the transition and long-term implications on this vulnerable demographic, and to make the necessary adjustments to make sure improvements are maintained and AIDS is eradicated in the future. [1,3].

4. Future possibilities

The authors think that governments and healthcare professionals are best able to address the effects of COVID-19 on PWH and HIV prevention programs. There is a pressing need to develop some forward-thinking, actionable recommendations to alleviate the stress and mental anguish of HIV patients so as to meet their present and future treatment requirements. Allowing government and healthcare professionals to reduce health inequities, build trust, and promote social cohesion.

4.1. Offline actions

In fact, offline service support is also crucial to HIV prevention and treatment. First, consider adding HIV and STI testing stations in major hospitals and even community hospitals to facilitate HIV testing. Reminding everyone that getting tested with new sexual partners ensures that new sexual partners are not passing HIV and STIs to each other. The government should then increase the number of locations offering pre-exposure prophylaxis (PrEP), a daily oral medication that reduces the risk of HIV infection, and continue to emphasize medical assistance for HIV patients under COVID-19 social distancing policies. It should not be affected, and at the same time, PrEP and HIV prevention knowledge should be disseminated to various communities, and people should be informed about the conditions under which PrEP can be consumed. At the same time, the surge of COVID-19 will increase the workload of hospitals, but the needles of HIV patients should be isolated to ensure that they are all sterile disposable needles, and when nucleic acid testing is performed, HIV patients should also be taken care of in a dedicated testing area.

Psychologically, popular science education should start in schools and even in the community to guide people not to discriminate against people living with HIV. Normal physical contact does not

spread disease and does not discriminate against gays or MSM. Even the government has the ability to organize some public welfare undertakings. Organizing and providing specialized care for HIV patients, such as meal deliveries, hugs, handshakes, and even lectures on how to prevent COVID-19, can reduce their psychological burden and anxiety [1,12,13].

4.2. Online actions

Helping people with HPV online can be beneficial. Experts advocate telehealth training for PWH healthcare practitioners to address current and future HIV treatment needs, minimize anxiety, and improve professional competence. The American Psychological Association (APA) joint working group developing telepsychology standards for psychologists may conduct regular telepsychiatry, certain online counseling mental health care providers (global) Helpful Lectures help PWH patients overcome the psychological barriers brought on by social isolation [1,13].

For online patient diagnosis, the triage model helps to better grasp patient needs. The first is classification. The hospital cloud outpatient service can realize online appointment registration, physical examination, HIV test appointment, report inquiry and online consultation, prescription preparation, prescription circulation, etc. The second is the cloud-based consultation service of grass-roots medical institutions in hospitals, which helps grass-roots doctors meet doctors or transfer patients to higher-level hospitals for treatment. If grass-roots hospitals lack inspection items and treatment guidance, they can get guidance from higher-level hospitals through the cloud. The third category is cloud referral services provided by secondary and primary hospitals. When a PWH has HIV-related immunocompromised disease and requires transfer, the primary care physician will submit a referral request and conduct an online consultation with a specialist. The "Internet Hospital" improves pre-hospital inspections, establishes green channels for admission service centers, and provides priority for bed reservation and medical treatment. Patients with stable condition can choose to be transferred, initiated by the hospital where they are located, and directly transferred to the ward of the local hospital to stabilize and consolidate their condition [1,12,13].

5. Conclusion

This article begins by contrasting COVID-19 with the HIV pandemic, using a biopsychosocial framework to describe the current and future effect of COVID-19 on HIV treatment, and using social survey data to illustrate how COVID-19 affects gay men and MSM. The authors conclude with offline and online strategies for governments and practitioners, and urge them to take action to address the negative impacts of all patients, especially male patients and other male patients. Health and mental health care workers are encouraged to fight for systemic change to lessen inequities encountered by disadvantaged and vulnerable groups in response to epidemics like HIV and COVID-19, with the phrase "We Are Together" continuing to describe our solutions. Governments also need to recognize that investing in health promotion and illness prevention is more expensive than dealing with infectious disease outbreaks.

Health promotion and illness prevention efforts can lessen the impact of new infectious diseases and protect important findings from the fields of medicine, sociology, and psychology. When it comes to preparing for and responding to global epidemics, health care providers play a pivotal role, and governments should recognize this. In fact, the development of pandemic and other diseases not only affects the physical and mental health of patients, but also causes physical and mental stress to medical staff. Although this article does not discuss the changes in the physical and mental health of medical staff in this context, the health and hardships of this group of people should be considered. In addition, the patient population represented in this article may be biased because it only includes information from gay males and men who have sex with other men. However, these people represent disadvantaged groups in society, and this is a reminder to governments and practitioners that if they can address the difficulties faced by disadvantaged groups, it will be relatively simple to solve the problems of others.

References

[1] Chenneville T, Gabbidon K, Hanson P, Holyfield C. The Impact of COVID-19 on HIV Treatment and Research: A Call to Action. Int J Environ Res Public Health. 2020;17(12):4548.

[2] UNAIDS. Trend of new HIV infections. 2020.

[3] Santos GM, Ackerman B, Rao A, et al. Economic, Mental Health, HIV Prevention and HIV Treatment Impacts of COVID-19 and the COVID-19 Response on a Global Sample of Cisgender Gay Men and Other Men Who Have Sex with Men. AIDS Behav. 2021;25(2):311-321.

[4] Illanes-Álvarez F, Márquez-Ruiz D, Márquez-Coello M, Cuesta-Sancho S, Girón-González JA. Similarities and differences between HIV and SARS-CoV-2. Int J Med Sci. 2021;18(3):846-851.

[5] www.hivireland.ie/hiv/covid19andhiv. Accessed 25 Sept. 2022.

[6] www.cdc.gov/hiv/default.html. Accessed 25 Sept. 2022.

[7] Stangl AL, Lloyd JK, Brady LM, et al. A systematic review of interventions to reduce HIV-related stigma and discrimination from 2002 to 2013: how far have we come?. J Int AIDS Soc. 2013;16(3 Suppl 2):18734.

[8] Hughes A.M., Campbell L., Graham H., et al. A biopsychosocial approach to HIV fatigue: A cross-sectional and prospective analysis to identify key modifiable factors;Behav. Med. 2020 :1–9.

[9] Miller T.R., Halkitis P.N., Durvasula R. A biopsychosocial approach to managing HIV-related pain and associated substance abuse in older adults: A review.Ageing Int. 2019 44:74–116.

[10] Centers for Disease Control and Prevention HIV Cost-Effectiveness: Basic Model Inputs for Cost-Effectiveness Analysis. 2022.

[11] Maital, S.; Barzani, E. The Global Economic Impact of COVID-19: A Summary of Research. Samuel Neaman Institute for National Policy Research.2020.

[12] Ho C.S., Chee C.Y., Ho R.C. Mental health strategies to combat the psychological impact of COVID-19 beyond paranoia and panic. Ann. Acad. Med. Singap. 2020; 49:155–160.

[13] Forgey Q. UN Calls for Global Response to Coronavirus Pandemic. Politico. [(accessed on 28 April 2020)]; 2020