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Vaccination in HIV positive adults: Need to address

Bhumika Bhatt, Harashish Jindal*, Shashikantha Sk, Jagbir Singh Malik, Kalpana Sangwan, and Junior resident
Department of Community Medicine; PGIMS; Haryana, India

Human Immunodeficiency Virus (HIV) continues to be a major public health program. Without treatment, average survival time without treatment after infection with HIV is estimated to be 9 to 11 years, depending on the HIV subtype. Vaccination recommendations are determined by weighing the benefits of vaccination against the risks. It is preferable to have patients on antiretroviral therapy (ART) prior to receipt of vaccination, as that may help blunt or eliminate vaccine-associated viremia and potentially improve immune response to vaccination. : Although data are limited, in general, HIV-infected individuals who are on ART with well-controlled HIV RNA levels and CD4 counts of >200 cells/μL (or = 15%) may receive indicated live-virus vaccines. Vaccination can play a vital role in enhancing the immunity against opportunistic infections. Further research, is the need for a better and healthy living of the people with HIV.

Introduction

The Human Immunodeficiency Virus (HIV) is a lentiviral disease that causes alteration in the immune system of the human body leading to Acquired Immunodeficiency Syndrome (AIDS), a condition in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive.[1]

HIV continues to be a major public health program. Infection occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate, or breast milk. Within these bodily fluids, HIV is present as both free virus particles and virus within infected immune cells. Without treatment, average survival time without treatment after infection with HIV is estimated to be 9 to 11 years, depending on the HIV subtype.[2] HIV infects vital cells in the human immune system such as helper T cells (specifically $CD4^+$ T cells), macrophages, and dendritic cells.[3] When $CD4^+$ T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes progressively more susceptible to opportunistic infections. HIV has caused more than deaths of 36 million lives. There were approximately 35.3 million people living with HIV in 2012.[4]

Vaccination in HIV Positive Adults

Vaccination recommendations are determined by weighing the benefits of vaccination against the risks. Although recommendations for HIV-infected patients are similar to those for HIV-uninfected patients in many respects, HIV can alter the efficacy and safety of vaccines and affect the susceptibility of the patient to the diseases for which immunization can confer protection.

Effects of Vaccines on HIV Disease Progression

Activation of the cellular immune system is important in the pathogenesis of HIV disease, activation of CD4 lymphocytes, which takes place when these cells respond to an antigenic stimulus, makes them more susceptible to HIV infection.

If feasible, it is preferable to have patients on antiretroviral therapy (ART) prior to receipt of vaccination, as that may help blunt or eliminate vaccine-associated

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*Correspondence to: Harashish Jindal; Email: harry8723@gmail.com

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viremia and potentially improve immune response to vaccination.[5]

There has not been much research on vaccines and people with HIV, especially since people started using combinations of antiretroviral drugs (ARVs).However, there are a few key guidelines for people with HIV.[6]

- Vaccinations can increase the viral load for a little while. Do not measure the viral load within 4 weeks of any vaccination.
- If the CD4 cell count is very low, vaccines might not work. If possible, strengthen the immune system by taking strong ARVs before vaccination.
- HIV-positive people should not receive most live vaccines including chickenpox (varicella) or smallpox vaccine. Do not get these vaccines unless the health care provider agrees that it is safe for you. Avoid close contact with anyone who got a "live" vaccination in the past 2 or 3 weeks.
- Killed or inactivated vaccines do not impose a risk for immunocompromised people.

Safety of live vaccines

Although data are limited, in general, HIV-infected individuals who are on ART with well-controlled HIV RNA levels and CD4 counts of >200 cells/μL (or = 15%) may receive indicated live-virus vaccines such as measles, mumps, rubella (MMR) and varicella if lacking immunity; but these vaccines should be avoided in patients with CD4 counts of <200 cells/μL.[7]

Recommended for All HIV Positive Adults[8]

Hepatitis B virus (HBV)

3 doses over a 6-month period .Recommended unless there is evidence of immunity or active hepatitis. Blood test to check for HBV antibody levels should be done after completion of immunization series. Additional shots may be necessary if antibody levels are too low.

Influenza flu

1 shot must be given every year. Only injectable flu vaccine should be given to those who are HIV positive. The nasal spray vaccine (Flu Mist/LAIV) should not be used in this population.

Polysaccharide pneumococcal

1 or 2 shots. It should be given soon after HIV diagnosis, unless vaccinated within the previous 5 y If CD4 count is <200 cells/mm when the vaccine is given, immunization should be repeated when CD4 count is >200 cells/mm 3. Repeat one time after 5 y.

Tetanus and diphtheria toxoid (Td)

1 shot to be repeated every 10 y.

Tetanus, diphtheria, and pertussis (Tdap)

Recommended for adults 64 y of age or younger and should be given in place of next Td booster. Can be given as soon as 2years after last Td for persons in close contact with babies less than 12 months and health care workers.

Measles, mumps, and rubella (MMR): 1 or 2 shots People born before 1957 do not need to receive this vaccine. HIV positive adults with CD4 count <200 cells/mm 3, a history of AIDS-defining illness, or clinical symptoms of HIV should not get the MMR vaccine. Each component can be given separately if needed to achieve adequate antibody levels.

If the CD4 count is more than or equal to 200 then **Influenza, Tdap, Pneumococcal, HPV, Hepatitis B, MMR, Chicken pox** (If born after 1980 and CD4 count >200) are recommended.

If CD4 count is less than 200 then **Influenza Tdap, Pneumococcal, hepatitis B, HPV** are recommended.[9]

Apart from this there are other vaccines which are required in some HIV positive adults these are **Hepatitis A, Hib, HPV, Meningococcal, HPV, and Varicella.**[8]

HIV-Positive Travellers

Every traveler with HIV should be sure they are vaccinated against hepatitis A and B.

Countries have different vaccination requirements for entry. In general, inactivated vaccines should not be a problem for travelers with HIV. However, they should avoid live vaccines, including yellow fever, and vaccinia. If polio or typhoid vaccines are required, they should be the inactivated versions, not the live versions.[6]

Conclusion

The vaccination among HIV positive cases may help improve their quality of the life. It demands more research as it is one of the gray areas of the disease. Vaccination can play a vital role in enhancing the immunity against opportunistic infections. Further research, is the need for a better and healthy living of the people with HIV.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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