

HIV/AIDS – Accomplishments and challenges?

Thirty years after its ensconce, another World AIDS Day on 1 December passes by and there has been an enormous magnitude of progress. According to UNAIDS, the number of new HIV infections has declined by one third in the last 12 years.

Since 2001, new HIV infections in children have decreased to 52%, and up to 2005, there has been almost a 30% drop in AIDS-related deaths, thanks to antiretroviral treatment that prevents mother-to-child transmission.

The human immunodeficiency virus (HIV) that causes AIDS infects 35 million people globally and has killed another 36 million, according to the United Nations.

As we mark the 30th observance of World AIDS Day on December 1, we have a golden opportunity to begin an end to the HIV/AIDS pandemic. To start with this, it has been an extraordinary year for HIV/AIDS research with lead line grabbing breakthroughs that stand as undeniable evidence of progress toward a cure. The first documented case of a child cured of HIV was reported in March 2013, which was followed by a report in July of two adult HIV patients no longer showing any signs of virus after undergoing stem cell transplants and stopping antiretroviral treatment.

Access to antiretroviral treatment around the world has increased exponentially. Famous musician and social activist Elton John has rightly said, “Love is the cure, compassion is the key – for individuals and for our global community.” However, the AIDS epidemic still continues. Elton John argues inequalities and stigmas that spread the disease around the world.

There is no cure, and experimental vaccines work poorly. Antiretroviral therapy can keep the virus suppressed to such low levels that patients are healthy and much less likely to infect others. But there are always a few pesky bits of virus remaining and, if the drug treatment is stopped, they usually start pumping out more viruses again. However, in a few extremely rare cases, patients appear to have been cured.



The most publicized cases involve three men with blood cancers who were treated with bone marrow transplants. They are all potentially cured and are in good health, years after treatment. The extremely toxic treatment to destroy their own bone marrow cells and replace them with transplants appears to have eradicated not only their cancer but also their HIV infection.

In the latest study, researchers tested a modified version of therapy now used to treat leukemia on blood taken from 15 patients with HIV, and found evidence differ it could score out infected cells. These so-called latent cells are the main reason that HIV cannot be cured – they lie low in the body, quietly resting till the drug treatment stops and then they roar back into action.

There is another more experimental approach to destroy the cancerous cells. It uses the radioactive monoclonal antibodies to target and destroy leukemia cells, and while it is still considered highly experimental, it is being tested against a range of cancers.

Ekaterina Dadachova of the Albert Einstein College of Medicine at Yeshiva University in New York and colleagues have been working with a cancer treatment called radioimmunotherapy to see if they can get rid of these latent cells. The treatment uses a monoclonal antibody – an engineered version of a human immune virus tied to a bit of radioactive material called bismuth 213. The antibody is designed to recognize HIV, and it homes in on an infected cell, delivering a deadly dose of radiation.

The radionuclide they used delivered radiation only to HIV-infected cells without damaging the nearby cells. Dadachova claims that it is not dangerous because the whole idea of radioimmunotherapy for HIV is using an isotope that can precisely target the infected cells. Tests in mice have shown that the treatment can wipe out all infected cells in the body or at least all the cells that could be detected using

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the current methods. So, the team tried it out on 15 patients being treated for HIV.

It killed the infected cells that were still circulating in the patients, and even penetrated into the brain – something that not many drugs can do – as claimed by Dadochona in a meeting of the Radiological Society of North America.

Antibodies know which cells to attach because they “displace” little pieces of protein on their surfaces. But HIV integrates itself right into DNA of a cell, and experts believe it can infect cells without displaying itself. If that is the case, there is no way for even a smart monoclonal antibody to find it.

One of the pitfalls is that we do not know the full extent of the HIV reservoir. However, experiments like that of Dadachova show great promise and need to be vigorously explored and tested. AIDS research is an example of an area where hard-won progress over many years has resulted in new and exciting possibilities in basic and clinic science in AIDS which must be pursued.

Much work lies ahead before the above-said and other scientific advances can be parlayed into a broadly applicable

cure that can be made available to the 35 million people living with HIV/AIDS worldwide.

But it is an irony bordering on tragedy that just as a cure for HIV/AIDS is beginning to seem like a realistic proposition, the belt-tightening measures of the age of austerity could halt our momentum, cripple our progress, and dash our hopes for ending AIDS in our lifetime.

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