Male circumcision, HIV treatment can significantly reduce new infections in African men

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Increasing the number of men who undergo circumcision and increasing the rates at which women with HIV are given antiretroviral therapy (ART) were associated with significant declines in the number of new male HIV infections in rural Ugandan communities, new Johns Hopkins Bloomberg School of Health research suggests.

The research, published July 12 in the *Journal of the American Medical Association (JAMA)*, is believed to be the first to show that two promising prevention methods that were successful in tightly controlled clinical trial settings have real-world effects. The findings suggest that further scale-up of these programs throughout sub-Saharan Africa could slow the HIV epidemic in the region.

"The biology of these two prevention strategies has been proven, but the big question was whether these strategies could have an impact on the number of new HIV infections in communities still struggling to control the spread of the disease," says study leader Xiangrong Kong, PhD, an associate scientist in the departments of Epidemiology and Biostatistics at the Bloomberg School. "Before our study, there was no empirical data to show the effects of scaling up these two interventions in real-world settings. It's important to know whether prevention is working and this is evidence that strongly suggests that African nations should redouble their efforts to scale up these programs."

The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates there are roughly 25.8 million people living with HIV in sub-Saharan Africa. In 2014, approximately 41 percent were on ART, though coverage rates vary widely. The World Health Organization estimates that between 2007 and 2015, more than 10 million men had been circumcised in 14 priority countries in this region.

Given the findings of the new study, these circumcisions should have a dramatic impact on new HIV infections going forward.

For the study, Kong and her colleagues used data collected from surveys between 1999 and 2013 in 45 communities in rural Rakai District in south-central Uganda, which included data on community-level ART coverage, male circumcision coverage, sociodemographics, sexual behaviors, HIV prevalence and rates of new HIV infections. They looked at three distinct periods: prior to the availability of ART and circumcision (1999-2004), during early availability of ART and circumcision and during full program scale up of both (2007-2013).

Over the study period, the median community coverage of male circumcision increased from 19 percent to 39 percent and median ART coverage increased from 0 percent to 21 percent in males and from 0 percent to 23 percent in females. The World Health Organization's target is for 80 percent of men in sub-Saharan Africa to be circumcised.

The researchers found that in communities where more than 40 percent of men had been circumcised, the rate of new infections among men was reduced by 39 percent as compared to those communities where 10 percent or fewer men had been circumcised. They also found that in communities where more than 20 percent of HIV-infected women were taking ART, there was a 23 percent reduction in rates of new HIV infections in men, as compared to communities where 20 percent or fewer of the HIV-infected women were taking the medications. No reduction was seen in HIV rates among women, but Kong says that may come going forward as male ART use increases.

Studies have shown that male circumcision

provides direct protection against male HIV acquisition by removing the foreskin, which is rich in HIV target cells. Convincing adult men to be circumcised is not an easy sell, Kong says, but results like these can go a long way toward expanding coverage in communities.

Kong says that low ART coverage observed in their study could be a result of WHO's guidelines for how early to start antiretroviral treatment. During much of the study period, only people with evidence of impaired immunity in their blood were given the treatment. Now that it is understood that ART is vital not just as a treatment but as a preventive measure in that it reduces how contagious someone is, guidelines recommend that it be prescribed upon diagnosis, irrespective of evidence of immune impairment.

Scaling up these prevention strategies isn't cheap, Kong concedes, but studies have shown that doing these two strategies together can be more cost-effective. Still, she says, international resources for treatment and prevention have remained flat since 2008. In the meantime, public health awareness programs need to be boosted to get more people tested and treated and get men into circumcision programs.

"We still have a long way to go in curbing the HIV epidemic in Africa," she says. "People need to adopt these strategies, and we need to have sustainable funding to support these efforts."

More information: "Association of Medical Male Circumcision and Antiretroviral Therapy Scale-up With Community HIV Incidence in Rakai, Uganda" *JAMA*, DOI: 10.1001/jama.2016.7292

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