Weighing costs, benefits of HIV treatments

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Prevention versus treatment? Cost versus efficacy? So go two of the dilemmas looming over Dartmouth's Paul E. Palumbo, M.D., and his fellow researchers in the race to fight HIV and other infectious diseases in the developing world — especially among women and their young children.

"We have this big quandary in resource-limited countries," says Palumbo, a Dartmouth Medical School professor of medicine and pediatrics. "We have a simple approach that is cost-effective, and reduces transmission [of HIV] by 50 percent. The Achilles heel of that approach is that in the mother and in any infant who does become infected, the virus learns to become drug-resistant."

Palumbo is co-leading a clinical study of anti-HIV medicines in Africa and India for the International Maternal Pediatric Adolescent AIDS Clinical Trials Group (IMPAACT). The randomized trial found that a cohort of 82 HIV-infected children ages 6 to 35 months responded better to treatment with the protease-inhibiting drug lopinavir (LPV/r) than did a cohort of 82 children in the same age group who received the anti-retroviral drug nevirapine (NVP). The infants all had previously received a single dose of NVP in liquid form at birth, and their mothers each had taken NVP in the form of a single pill during labor in an attempt to prevent HIV transmission.

In July, IMPAACT leaders presented their findings in South Africa at the inaugural International Workshop on HIV Pediatrics and the International AIDS Society's fifth Conference on HIV Pathogenesis

Treatment and Prevention. Chief sponsors of the trial are the National Institute of Allergy and Infectious Diseases (NIAID) and the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

Findings also revealed that the LPV/r arm of the trial showed results so much better that in the spring of 2009, an independent data and safety monitoring board (DSMB) halted the NVP arm and gave the go-ahead for IMPAACT to enroll children who did not receive NVP at birth.

"These findings," NIAID stated in a recent bulletin, "provide clear evidence in support of the current World Health Organization recommendation that HIV-infected infants who have received NVP at birth should be started on an LPV/r-based treatment regimen whenever possible."

But here's the rub: LPV/r is a relatively expensive drug more available in the developed than the developing world, and it must be kept cold — a challenge in sub-Saharan Africa and much of India. On the other hand, NVP is relatively cheap and accessible in developing nations.

Breast-feeding presents another challenge: While it can lead to infection of the infant of an HIV-positive mother, the mother's milk also protects the child against many common infections of infancy, Palumbo says. Also, formula feeding to prevent transmission of HIV — a common practice in the developed world — leaves infants prone to suffer from upper-respiratory infections, diarrhea, and other maladies. According to estimates of the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), more than nine million children younger than 5 are expected to die each year — 17 percent from pneumonia, 17 percent from diarrhea, and 7 percent from malaria, as opposed to 1.5 percent from HIV/AIDS. At least 10 percent of enrollees in the IMPAACT study already are or may be suffering from

tuberculosis.

That's why, as the trial continues, IMPAACT will examine whether NVP becomes effective again in HIV-positive children after a certain age.

"There's a big, dynamic struggle going on as we speak," Palumbo says. "We're right in the middle of this active debate. The question is, how fast can we do it? Can scientific mandates be translated into practice? … Those data are going to be used to inform the prevention and treatment guidelines at WHO. I still don't know how it's going to play out." Palumbo also serves as executive director of the Dartmouth-affiliated DarDar Pediatric Program in Tanzania.

Source: Dartmouth College