Double Exposure

HIV can ring twice. Are dual infections a mounting threat—or a molehill?

June 1, 2004

Remember Patient Zero? In *And the Band Played On*, Randy Shilts branded the gay Canadian airline steward a Typhoid Mary who spread HIV to gaggles of gay men in the early ’80s. Two decades later, another gay man is in the transmission spotlight: not for spreading HIV but for contracting it—twice. Meet Patient AC-06, a 42-year-old *superinfected* with a second—possibly more virulent or drug-resistant—shot of HIV (see “Doublespeak” below). Massachusetts General Hospital’s Bruce Walker, MD, reported the case at the 2002 world AIDS confab, fanning the flames of a debate over whether HIVers should use condoms when having sex with one another.

Patient AC-06 had been thriving on—and off—HAART when his viral load shot up during a brief drug holiday in 2000, a few weeks after unprotected sex. He also had the flu-like symptoms that announce HIV infection. A genetic analysis fingered a second HIV subtype as the culprit—and the second strain had multiplied his viral load.

While HIVers might worry about superinfection, those who are negative can focus instead on the danger of becoming *coinfected* with two HIV strains at the same time. Last August, scientists at the University of Cape Town, South Africa, led by Jandre Grobler, MD, described four local women sex workers who’d been coinfected, or hit with more than one strain of HIV in the early period before antibodies emerge—and got sicker faster than others in the study. In February, a University of Washington team reported in *The Lancet* that four co- and one superinfectee had progressed to AIDS in two to four years (vs. eight to 10 for those with only one strain).

>> What Does It Mean?

Experts disagree on how often dual infection strikes (whether the “co-” or “super-” kind), but all seem to agree that acquiring more than one virus spells trouble. The coinfected can have two HIV strains with multiple mutations (*viral diversity*), making it harder for the immune system to control the virus. The marker of how well a person’s immune system controls HIV is a set point: where the viral load lands after early infection (lower is better). The four coinfected South African sex workers had much higher set points and more viral diversity than the other 28 women, while coinfectees in the U. of Washington study had atypically low CD4 counts in early HIV.

Superinfection can be equally harmful: HAART may subdue a first virus but fail to lick a second strain that is already resistant. Walker’s colleague, Paul Farmer, MD, of Partners in Health,

explains, “If a patient [has] two strains, one fully susceptible and one resistant [to some drugs], a regimen based on those drugs is likely to suppress the susceptible strain [but not] the drug-resistant strain.” He bases this partly on studies of drug-resistant tuberculosis.

Luc Perrin, MD, a Swiss researcher and superinfection expert, says the extra damage to the immune system caused by dual infection could mightily complicate not only individual treatment but vaccine development, because a vax would have to spark immune responses as diverse as those HIV strains.

As for Patient AC-06, he’d responded well to meds after his first infection, allowing him to enjoy several successful strategic treatment interruptions (STIs). But STIs after his second infection became increasingly difficult to maintain, putting him back on meds more quickly than after past holidays. In November 2003, his viral load shot up to 165,000 and his CD4s fell to 394; now, he’s considering restarting treatment. “He has had a progressive decline in CD4-cell count, so I would say there is clear damage,” Walker says. “The thing we can’t answer is how he would be doing now without this superinfection—whether he might have lost control of his original virus by now [anyway].”

And given that chicken-and-egg dilemma—plus, the minuscule number of known cases—experts are in the dark about how much of a threat dual infection poses. For example, Grobler wonders if the South African sex workers had some genetic factors or immune deficiencies that made them vulnerable to coinfection in the first place. Patient AC-06, too, might harbor an immune-system weakness or quirk that made him prone to a second hit of HIV.

>> What to Do About It

“If we have evidence of [superinfection], it’s awfully preliminary,” Farmer says. Still, like Walker, he worries that HIVers, such as Patient AC-06, who ditch condoms risk exposing themselves and others to more HIV—especially if they do so while on drug holidays: On a break, your HIV is no longer being controlled by the meds, so you’re more likely to pass it on. (Second strains can enter via IV-drug use, too.) There are more questions than answers at this point—and brand-new evidence of superinfection in 5 percent of 78 new HIVers in California who weren’t yet taking meds (see “Report from Retro”).

Despite all the question marks, the dual-infection cases add up to “an important cautionary tale” for HIVers, U. of Washington researcher Mark Jensen, PhD, told *POZ*, adding, “Protection is important even between HIV positive people.” And Farmer agrees that, “at least until we have more information on superinfection,” raw is not worth the risk.

Doublespeak

Learn the HIV dual-infection lingo:

Superinfection—You're already positive, then you're exposed to a second, distinct HIV strain. (Don't confuse it with reinfection, where the first infection has already been cleared from your system. That could happen with hepatitis but not HIV.)

Coinfection—You're simultaneously exposed to more than one HIV strain during the period of acute infection before HIV antibodies form (seroconversion, or testing positive). Don't confuse this coinfection with that of two completely different viruses, like HIV/hepatitis coinfection.

Viral diversity—HIV viruses can develop different mutations. Through dual infection they can combine and produce new strains that have several mutations at once.

How do docs tell whether an HIVer is dueling a dual infection? A genetic test can compare mutations in the viral protein structures.
