LETTER

Prevention of early HIV transmissions might be more important in emerging or generalizing epidemics

Early HIV infection accounts for up to 50% of transmission events in diverse epidemics, including those among men who have sex with men, heterosexuals, and injection drug users (IDUs). Early antiretroviral treatment initiation stops disease progression and prevents onward transmissions.

Eaton and Hallett model the effect of early transmission on the data from the generalized heterosexual epidemic for a 30-y period and show that in long-term perspective, the effect of early transmission prevention is low (1). Specifically, failure to prevent transmissions from the recently infected group under various assumptions caused only a 20% reduction in the effectiveness of antiretroviral treatment to prevent new infections after 30 y. However, the authors do not report the number of recently infected people in South Africa, which has been declining over the years and might become even lower in the long term. Knowing the proportion of recently infected in the population over time would help us understand the importance of treatment as prevention (TASP) in this group.

Unlike the South African HIV epidemic, emerging or generalizing epidemics result from a breakthrough of the epidemic into a new pool of susceptibles, which in turn shrinks the generation time (i.e., average time between an individual becoming infected and transmitting to other individuals). In such outbreaks, we expect that transmission will be mainly led by early infection. For example, our preliminary analysis of Russian data showed that the HIV epidemic emerged in the 1990s and was driven by rapid transmissions from acutely infected IDUs within the first month of their infection (2). Similar effects are expected during generalization of epidemics. For example, the Latvian IDU-driven epidemic resumed exponential growth through HIV spillovers from high-prevalence groups (IDUs) to low-prevalence groups through sexual transmissions (3). Similarly, the Greek HIV epidemic was mainly circulating among men who have sex with men, with few IDU infections until 2009, when multiple unrelated HIV outbreaks were introduced to the IDU group, resulting in a dramatic increase of recently infected individuals (4).

The group of recently infected might be more important also for epidemics driven by other ways of transmission. For example, in IDU-driven epidemics, young or recent injectors who seroconvert may well be injecting unsafely with other new (and uninfected) injectors, which creates potential for shared-equipment contamination with highly infectious blood among multiple susceptible IDUs. The increase of transmissibility during early infection in this group seems to be enhanced by network and behavioral aspects on top of virus-host biology.

The main obstacle to the TASP approach for the recently infected is that early infection has nonspecific symptoms. Innovative social network-based interventions are being tested, like the Transmission Reduction Intervention Project and Project Protect, which distribute information about the presence of recently infected highly infectious people and elevated HIV risk through the injecting and sexual networks of recently infected individuals (5). Such prevention strategies might decelerate transmissions in settings where the proportion of recently infected individuals grows, giving TASP more time to be effective.

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