The Novel CRFs Reveals Higher Prevalence of Superinfection of HIV in China

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Recombination is one of the most important forces driving HIV evolution with a way of large genetic fragment replacement. It is estimated that recombination occurs at more than 2.8 crossovers per genome per cycle [1]. The novel recombinant having the distinct structure with its parent’s sequences is the product of at least two kinds of subtypes or CRFs. Therefore, the frequently prevalence or appearance of a novel Circulating Recombinant Form (CRF) implies the prevalence of super-infection of various HIV in a local area. Since the first CRF of HIV CRF01_AE was identified in 1996, 72 CRFs and hundreds URF was identified [2]. During recent years, a lot of CRFs or URFs was reported, especially in Southeast Asia.

In China, CRF01_AE was the first CRF which was introduced from Thailand about early 1990s [3]. CRF07_BC and CRF08_BC were identified among Intravenous Drug Users (IDUs) in 2000 in Yunnan Province in China [4]. Among fragments of CRF07/08_BC circulating in China, B subtype is B’ introduced from Thailand and C subtype from India through IDUs. These two CRFs have been the major HIV which accounts for more than 83.2% in China and prevail among various HIV-positive populations [5]. In 2009, Guo et al. for the first time reported the recombinants formed between CRF01_AE/CRF07_BC among a cohort of IDUs with an epidemiological link [6]. As we knew, intravenous injection of drugs had been the predominant route among transmission ways of HIV in China, especially this route play a major role on CRF07_BC and CRF08_BC spread.

From 2014 to present, more and more CRFs were identified in China [7-18]. These CRFs include the recombinant between CRF01_AE and CRF07_BC, between CRF01_AE and subtype B, between subtype B and subtype C, among CRF01_AE, subtype B’, and subtype C. The recombinant from two or three same subtypes and CRF in various area often has the distinctly genome structure and break point of recombination occurring. For example, the genome structure and break point of recombinant of CRF01_AE/07_BC identified in Jiangsu province by Guo et al. is significantly different with that in Guangxi province by Dong. The recombinants formed from same subtypes also were found among various populations with higher risk behavior. However, more recombinants were identified for the first time among men who sex with men. These reveal multiple infection of various subtype is common in China, especially among men who have sex with men.

More effort is made on controlling and preventing HIV spread in China and the speed of HIV spread has been reducing during recent years. However to control HIV prevalence still faces to a great challenge. Currently, men who sex with men are predominant among the newly diagnosed HIV-positive population, and the HIV prevalence among young people has been rapidly increasing [19]. In these populations, the usage of condom is very low. It accelerates HIV transmission and multiple infections, followed by recombination between various subtypes.

Recently, the novel recombinant of HIV frequently emerged in China. It implies that higher superinfection of HIV exist and the importance of the management for HIV positive population and early diagnose of HIV infection on stopping HIV spread in China.
References


