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Oral presentation

Role of R5 phenotypic variation in mother-to-child transmission of HIV-1

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Background

R5 viruses were shown to have an intrinsic phenotypic variation, as demonstrated by their capacity to differentially infect *in vitro* target cells expressing CCR5/CXCR4 chimeric receptors [1,2]. In this study we have explored the hypothesis that the phenotypic variation of R5 viruses of pregnant women could play a role in mother-to-child transmission (MTCT) of HIV-1.

Materials and methods

Virus isolates obtained from 59 mothers (24 transmitting and 35 non transmitting) and from 24 infected children were tested for their ability to infect U87.CD4 cells expressing the wild type chemokine receptors CCR5 or CXCR4, or the six CCR5/CXCR4 chimeric receptors.

Results

Transmitting mothers (7 out of 24) carried more often viruses able to use both CCR5 and CXCR4 coreceptors than non transmitting mothers (3 out of 35) (p=ns). The analysis of the chimeric receptor usage showed that 57.1% of maternal R5 isolates displayed an R5narrow phenotype (28 out of 49 R5 viruses), as they exclusively used wild type CCR5 and none of the chimeric receptors and were similarly distributed in transmitting and non transmitting mothers. Multiple chimeric receptor using viruses (R5broad) were more frequent in non-transmitting mothers than in transmitting mothers (in 15 and 6, respectively; p=ns), and utilized more frequently one specific chimeric receptor (FC4b) (13/15 *vs*. 2/6, respectively; p=0.056), but were independent from transmission event.

To understand if selective processes occur during transmission, we compared the phenotype of the virus isolates of 21 mother-child pairs. All ten mothers harbouring an R5narrow virus had children who displayed the same viral phenotype. Interestingly, the six mothers carrying R5broad viruses transmitted in all but one case a virus with an identical or similar broad chimeric receptor usage. On the contrary, the five mothers with an R5X4 virus transmitted the whole spectrum of virus phenotypes: two R5narrow, two R5broad and one R5X4.

Conclusions

Our results show that the presence of an R5broad virus appears not to be prognostic of MTCT of HIV-1. The majority of viruses replicating at a time point close to infection are restrictive to the use of wild type CCR5, however, transmission of R5broad viruses is not limited.

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