Short-term risks involved in transitioning between two HIV treatments: predictions through a Quantitative Systems Pharmacology approach.

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**Objectives:** Clinicians frequently decide on new treatments for HIV-infected patients. During this transition period, the resurgence of viral loads, often associated with decreased immunity and emerging new resistance mutations, has to be avoided. Thus, assessment of the short-term risks is crucial for treatment transition. In this study, predictions from switching from efavirenz to dolutegravir, both in combination with two nucleoside reverse transcriptase inhibitors, were obtained.

**Methods:** A Quantitative Systems Pharmacology (QSP) model that we previously developed was used. This model was calibrated using available information on drug-drug interaction (DDI). Using an *in silico* approach, viral load curves resulting from the treatment transition were obtained taking into account the variability in population. These curves were then used to assess the risks of high viral loads in the patient population.

**Results:** The model adequately reproduced the viral rebounds observed in a population of patients interrupting treatment. The variability in drug disposition, immunity, and quasi-species along with the presence of resistance mutations prior to treatment change, were identified responsible for a high variability in short-term response to the new treatment.

**Conclusions:** To lower the risks of viral loads resurgence during treatment switch, the parameters significantly varying between individuals should be paid special attention. The study results highlight the importance of patient focused data collection.

**References:**