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Adolescents and young adults on first-line ART prefer a self-administered electronic questionnaire to assess ART adherence

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Because many young South African's have been exposed to mobile technology we set out to determine if a self-administered electronic questionnaire would be an acceptable approach to measure adherence to ART. Cross-sectional study among HIV positive adolescents and young adults (18-35 years) on first-line ART for >3 months at the Themba Lethu HIV Clinic in Johannesburg, South Africa between 07/2015–01/2016. Participants were asked a series of questions to assess their preference for a self-administered electronic versus a counsellor/social worker administered paper-based questionnaire to measure adherence to ART. Of the 77 participants enrolled (14% refusal rate), 19 (25%) were male and the majority (88%) had been on ART for more than 12 months. 66% (51/77) reported good adherence, defined by a VAS score ≥90%. When using a five-level Likert scale, 80% (41/51) agreed or strongly agreed that they are comfortable using a Smartphone or tablet. 60% (46/77) reported that they preferred an electronic questionnaire on a Smartphone or tablet over a paper form and 68% (52/77) preferred a self-administered questionnaire over an interview-administered one. Finally, 95% (38/40) of study participants who completed the adherence questionnaire on an electronic device reported that it was relatively easy to complete. Conversely, 52% (40/77) had concerns about confidentiality and that their responses would not be stored and transferred safely on an electronic device. In order for self-administered electronic questionnaires to be useful in routine clinic settings participants need to be reassured that their responses will be securely stored and transferred to maintain patient confidentiality.

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H_2O_2 signals via iron induction of VL30 retrotransposition correlated with cytotoxicity

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The impact of oxidative stress on mobilization of endogenous retroviruses and their effects on cell fate is unknown. We investigated the action of H_2O_2 on retrotransposition of an EGFP-tagged mouse LTR-retrotransposon, VL30, in an NIH3T3 cell-retrotransposition assay. H_2O_2 treatment of assay cells caused specific retrotranspositions documented by UV microscopy and PCR analysis. Flow cytometric analysis revealed an unusually high dose- and time-dependent retrotransposition frequency induced, ~420,000-fold at 40 mM H_2O_2compared to the natural frequency, which was reduced by ectopic expression of catalase. Remarkably, H_2O_2 moderately induced the RNA expression of retrotransposon B2 without affecting the basal expression of VL30s and L1 and significantly induced the expression of various endogenous reverse transcriptase genes. Further, whereas treatment with 50 mM FeCl2 alone was ineffective, cotreatment with 10 mM H_2O_2 and 50 mM FeCl2 caused a 6-fold higher retrotransposition induction than H_2O_2 alone, which was associated with cytotoxicity. H_2O_2 - or H_2O_2 /$FeCl_2$-induced retrotransposition was significantly reduced by the iron chelator DFO or the antioxidant NAC, respectively. Furthermore, both H_2O_2-induced retrotransposition and associated cytotoxicity were inhibited after pretreatment of cells with DFO or the reverse transcriptase inhibitors efavirenz and etravirine. Our data show for the first time that H_2O_2, acting via iron, is a potent stimulus of retrotransposition contributing to oxidative stress-induced cell damage.

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