

PA30 Preclinical evaluation of lime juice as a potential microbicide

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ABSTRACT TEXT

Background:

Lime juice is currently being assessed in phase I clinical trials for potential use as a microbicide/spermicide. However there is little peer-reviewed preclinical data. Here we present preclinical safety and efficacy studies assessed using a range of cellular and ex vivo tissue models.

Methods:

Virucidal activity was assessed by direct treatment of virus immobilized to culture plates in the absence or presence of human semen. Infectivity was determined on co-culture with susceptible T cells by measurement of released p24 or reverse transcriptase activity. Toxicity studies were carried out using a range of cellular and ex vivo tissue models and viability determined by MTT assay.

Results:

10% (or greater) inactivates HIV within 5mins in culture. However, in the presence of semen, 100% inhibition is only seen with 50% for 30mins; shorter time periods or lower concentrations fail to demonstrate significant inactivation. Reconstituted stratified epithelium (MatTeK) appears relatively resistant to topical application, with no significant adverse effects observed after 1 hour exposure to 50% lime juice. However, significant cell death is observed with doses >10% on multiple exposures (5x) in 24 hours or 1 hour application every day for five days. Furthermore, 50% rapidly kills (within 5 mins) cervical explants and penile explants cultures in conditions that mimic breakdown in epithelial integrity.

Conclusions:

Infectious semen will need to be exposed to 50% lime juice for a minimum of 30 minutes in order to inactivate HIV in vivo. It is unclear what volumes/doses would be required to maintain such concentrations within the vaginal lumen. While lime juice (up to 50%) is likely to be well tolerated by intact stratified epithelium, it is highly likely to induce localized toxicity where there is any physical abrasion of these protective barriers or on exposure to endocervical epithelium.

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