Inactivation of human immunodeficiency virus by a medical waste disposal process using chlorine dioxide.

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Abstract

OBJECTIVE:
To study the ability of a medical waste disposal process using chlorine dioxide to inactivate human immunodeficiency virus type 1 (HIV-1).

DESIGN:
Stock HIV-1 (HTLV-IIIB strain) was treated with chlorine dioxide under the following settings: cell culture medium alone, culture medium with 25% blood, culture medium with medical supplies treated by the Condor machine (Winfield Environmental Corp., Escondido, CA). MT-2 cells in 96-well tissue culture plates were inoculated with serial tenfold dilutions of treated and untreated HIV-1. Cytopathic effect was read on day five, and the TCID50 (50% tissue culture infectious dose) was calculated.

RESULTS:
Treatment of HIV-1 with chlorine dioxide in culture medium alone resulted in a 5.25 log10 reduction in TCID50. Treatment of HIV-1 with chlorine dioxide in the presence of 25% blood caused a 6.25 log10 reduction in HIV-1 infectivity. Treatment of HIV-1 with chlorine dioxide in the presence of medical supplies treated in the Condor machine resulted in a 4.75 log10 reduction in HIV infectivity.

CONCLUSIONS:
Chlorine dioxide inactivated HIV-1 in vitro. Chlorine dioxide inactivated HIV-1 in the presence of blood and in the presence of medical supplies under conditions that simulated the conditions existing in the Condor machine.

PMID:8228160