E-101 Solution Demonstrates Antiviral Properties Against Herpes Simplex Virus, Human Immunodeficiency Virus, and Human Influenza A/H1N1 Virus

Background: E-101 Solution is a novel myeloperoxidase-based topical antimicrobial agent that generates hypochlorous acid and singlet oxygen by the action of glucose oxidase. It is composed of 1% porcine myeloperoxidase (pMPO) and glucose oxidase (GO), which are the substrate for pMPO and GO, respectively, and specific amino acids that stabilize the enzymes once the system has been activated during mixing of all the components. The purpose of this study is to determine the intrinsic nature of the MPO-mediated microbial injury is ubiquitous for all microbes. The viruses studied in this report represent major causes of human disease. There are a variety of clinical indications where E-101 Solution might be an effective in killing bacteria and yeast/fungi under both in vitro and in vivo conditions, could be applied to oral, respiratory, genitourinary, and rectal mucosal surfaces to help prevent or treat a broad array of epithelial-related infections and diseases.

METHODS

RESULTS

In vitro antiviral efficacy of E-101 Solution against prototype viral strains that cause major unmet public health problems.

The viruses studied in this report represent major causes of human disease. Each of these viruses utilizes a pathogenic process that involves human mucosa as the infection entry gate followed by different pathways of virus dissemination into susceptible organs. The viral replication cycle promotes further infectivity or dissemination of disease to susceptible host. E-101 Solution could be properly applied to oral, respiratory, genitourinary, and rectal sites and lead to sufficient end products of MPO, which interact with the infected cells and interfere with the infectivity of these viruses. In fact, it would be expected that other locally designated microbes (irrespective of whether they are bacteria, yeast, or fungi) would be killed because the intrinsic nature of MPO-mediated microbial injury is ubiquitous for all microbes. The combination of an effective topical antiviral plus a systemic antimicrobial would be expected to provide complementary killing or anti-infectivity effects against target microbes that have a mucosal phase of colonization and/or epithelial attachment prior to systemic dissemination. It would be expected that this would decrease the severity of disease in an individual or reduce the transmission of infection to the susceptible population. In this study, E-101 Solution had uniform virucidal effects on HSV-1, HIV-1, and H1N1. The presumed virucidal mechanism of action of E-101 Solution on these viruses is direct oxidative damage. In an era of increasing viral resistance in drugs, the therapeutic application of E-101 Solution for these viral infections is attractive, because there are no known mechanisms to avoid the killing effects of MPO-mediated microbial injury once it has produced its end products.