A NOVEL HALOGENATED ANAESTHETIC SOLUTION: PHYSICAL AND CHEMICAL STABILITY STUDY

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Background

Recently has been reported in the literature using an alternative liquid sevoflurane on vascular ulcers. Innovate topical application of this halogenated anesthetic for management of analgesia appears to be successful. The selection of DMSO as a vehicle for sevoflurane responds to both pharmaceutical and pharmacological needs: it is a polar solvent chemically compatible with sevoflurane over a wide range of concentrations. Additionally, some studies suggest it might possess some analgesic, hydroxyl free-radical scavenger, healing, and antimicrobial properties after topical application, enhancing the activity of sevoflurane

Purpose

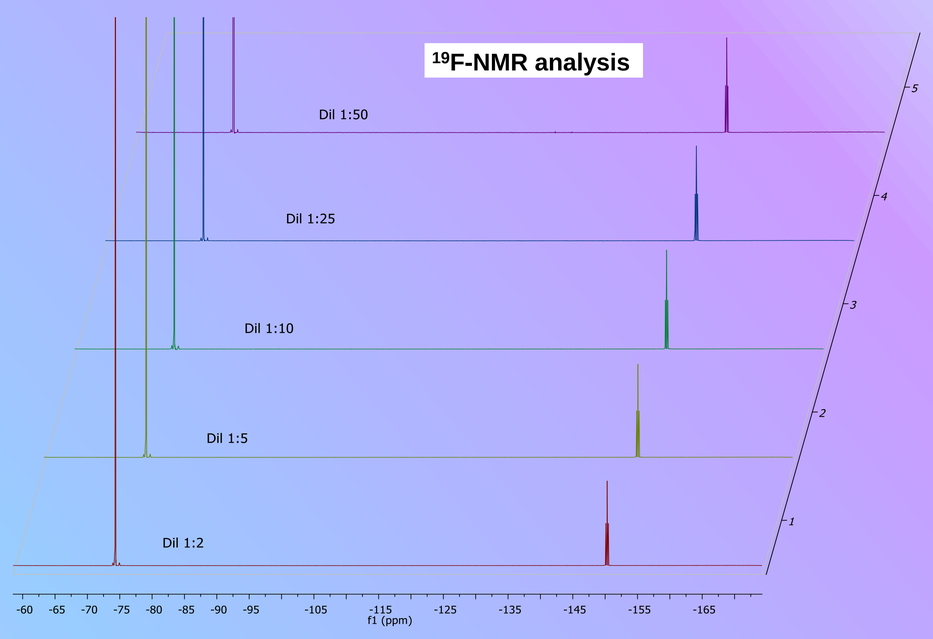
Stability evaluation of sevoflurane dilution in dimethyl sulfoxide (DMSO).

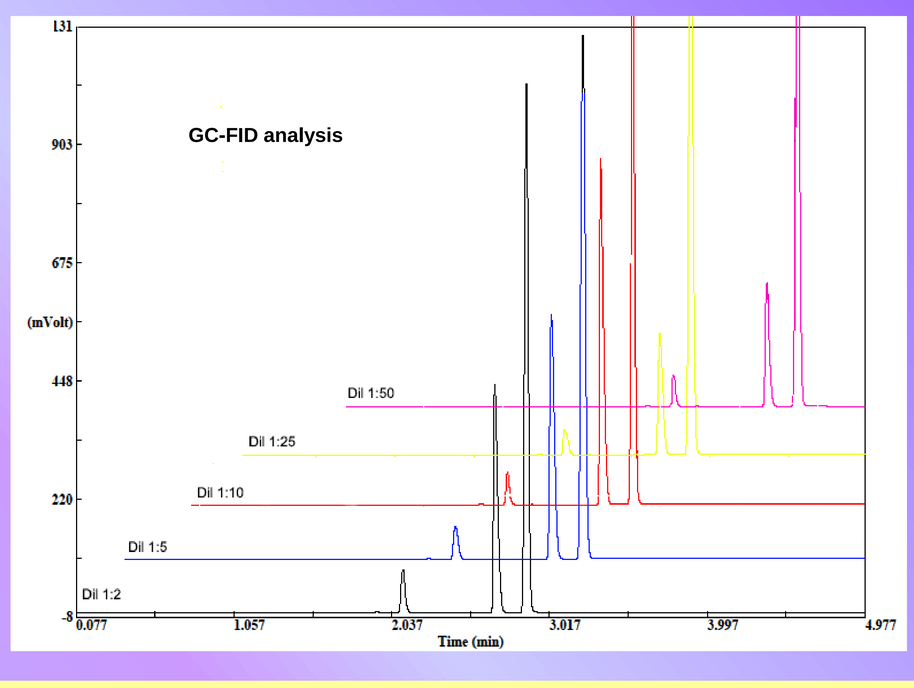
Material and methods

Sevoflurane dilutions 1:2 and 1:50 in dimethyl sulfoxide were prepared and stored at different temperatures (23ºC, 6ºC, and -10ºC) for 21 days. The presence of sevoflurane and its degradation products in the samples was determined by gas chromatography (GC) with flame ionization detector, and by ^{1}H, ^{19}F, and proton-decoupled ^{19}F nuclear magnetic resonance (19F NMR).

Results

During 21 days, the clear and colorless solution remained. 19F NMR in the same signals were observed in all samples, these signals corresponding to the chemical structure of Sevoflurane and DMSO unchanged. Meanwhile, in the GC analysis, no occurrence of any additional peak was shown at each temperature storage. Both analytical techniques, no breakdown products were detected in any of the samples.





Conclusions

This study shows that different concentrations of sevoflurane in dimethyl sulfoxide retain their chemical composition after exposure to different temperatures for a period of at least 21 days. These findings represent an important step in the pharmaceutical formulation of topical sevoflurane solutions.

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