

Hydrogen Peroxide Plasma Sterilization Sabotages the Efficacy of Lidocaine HCl Injection [Abstract]

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Background:

Lidocaine injection with 2% HCl as an anesthetic drug must guarantee its sterility to avoid microbial contamination. In efforts to maintain the sterile preparation of Lidocaine HCl 2% before use in hospitals, some anesthesiologists opt for re-sterilization.

Objective:

This study aimed to evaluate the impact of plasma sterilization using hydrogen peroxide on Lidocaine HCl levels employing a validated Ultra Performance Liquid Chromatography (UPLC) assay.

Methods:

The 2% Lidocaine HCl samples were separated into two groups, one undergoing re-sterilization with hydrogen peroxide and the other handled only with aseptic techniques. The chromatographic assay was performed using a Waters Corp Acquity UPLC® H-Class system and a Waters Corp Acquity UPLC® BEH C18 column, with a mobile phase of 20% Acetonitrile and 80% Acetate Buffer pH 3.4, flow rate of 0.3 mL/min, and total duration of 4.5 minutes.

Results:

The results showed a decrease in Lidocaine HCl levels to 1.88% after re-sterilization and 2.01% without re-sterilization.

Conclusion:

These findings suggest that re-sterilization with hydrogen peroxide plasma sterilization leads to a significant decrease in Lidocaine HCl levels, causing non-compliance with pharmacopoeia standards.

Keywords: Hydrogen peroxide, Plasma sterilization, Lidocaine HCl, Anesthetic drugs, Sterility, UPLC.

Abstract Information

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Dr. Ding got her MD and Ph.D from China and completed her postdoctoral fellowship training in Cleveland Clinic Foundation, USA. Currently, she is a staff Anesthesiologist at University Hospital Cleveland Medical Center and Associate Professor of Anesthesiology at Case Western Reserve University. She has published more than 50 manuscripts and book chapters. She has been serving some ASA subcommittees and as an editorial board member of Frontiers in Medicine- Intensive Care Medicine and Anesthesiology section.

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