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.

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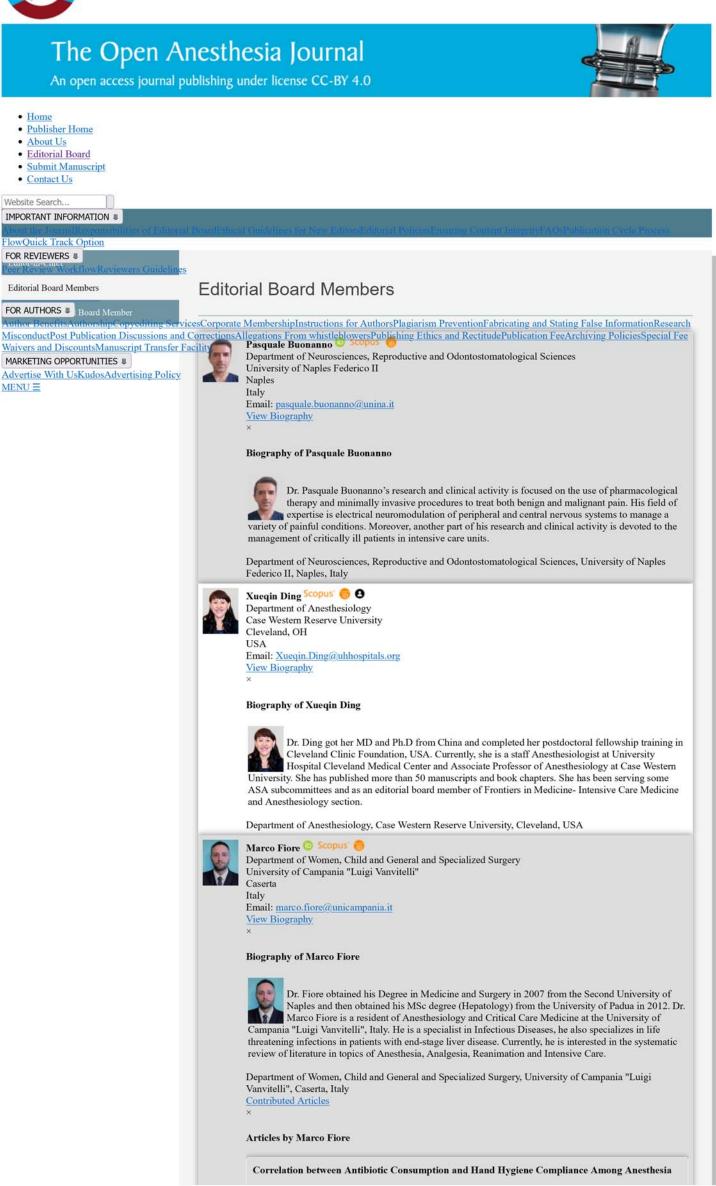
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