Background: In a previous study, we highlighted the importance of establishing precise decontamination procedures for the NeilMed® Sinus Rinse™ bottle and recommended a microwave cycle of 90 seconds for optimal decontamination. Although higher levels of decontamination were observed at microwave durations exceeding 90 seconds, this was at the expense of thermal degradation and deformation of the reservoir plastic component of the irrigation bottle.

Objectives: To assess the changes in the structural integrity of the NeilMed® Sinus Rinse™ bottle following repeated microwave cycles to inform on how frequently these bottles can be microwaved before it has to be changed.

Design: University laboratory-based study.

Methods: To mimic real-life conditions, the bottle was rinsed under running tap water. Excess water was shaken off before being placed in a microwave. The bottles were subjected to either 90 or 120 seconds microwave for 50, 100, 150, 200 and 250 cycles respectively. Compression (Figure 1) and tensile (Figure 2) testing was undertaken at the end of each prescribed microwave duration and number of cycles. Tensile testing was reported as yield strength (defined as the stress at which a material begins to deform plastically) while compression testing was reported as stiffness (defined as the extent to which a material resists deformation in response to an applied force).

Results: Changes in yield strength was noted after 90 seconds, 100 cycles and 120 seconds, 50 cycles (Figure 3) compared to a non-microwaved bottle. The stiffness of the bottle gradually decreased with incremental microwave cycles. After 250 microwave cycles at 90 seconds, stiffness was significantly lower compared to a non-microwaved bottle. At 120 seconds, stiffness was significantly lower after 200 cycles.

Conclusion: Although changes thermoplastic properties were identified, it is unknown at what microwave cycle the bottle loses its flexibility to generate sufficient volume and pressure head. Assuming patients rinse twice daily and microwave decontaminate the bottles after each use for 90 seconds, the data does not support any revisions in the manufacturer’s recommendation to change the bottles every three months.

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