MICROBIOLOGICAL ANALYSIS OF HOSES OF WASHER-DISINFECTORS USED FOR PROCESSING GASTROINTESTINAL ENDOSCOPES IN USE IN CLINICAL PRACTICE

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AIM

To evaluate the microbial load and the presence of biofilm in hoses of washer-disinfectors used for processing gastrointestinal endoscope in use in clinical practice.

METHODS

Cross-sectional study conducted at an Endoscopy Center of a large public hospital in the Midwest region of Brazil. Flexible hoses made of translucent Polyvinyl chloride (PVC) with polyester braids, measuring approximately 1 cm x 130 cm (diameter x length), from two washer-disinfectors were collected (removed) following aseptic technique after one, three and 12 months in use, totaling six hoses. The collected hoses were replaced with new ones with the same specifications. Each hose collected was cut in seven fragments (Figure 1), using sterile scalpel blades, and subjected to analytical tests to determine the microbial load by culture and presence of biofilm by Scanning Electron Microscopy (SEM).

SEM was performed on the fragments of the hoses in use for 12 months. For the microbial culture, tryptic soy broth (TSB) was inserted into hoses fragments of approximately 30 cm (E1, M1, M2 and E2) (Figure 1), which were sonicated for 10 minutes. TBS was filtered through a membrane (0.22µm), placed onto nutrient agar and incubated for up to 48 hours at 35oC. Following, Colony Forming Units (CFU) were counted and the bacteria colonies were classified according to Gram' stain. For SEM, fragments of 1 cm from the ends and the middle of the hoses (Figure 1) were fixed with 2.5% glutaraldehyde and dehydrated at increasing concentrations of ethanol.

References

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RESULTS

Bacterial growth was detected for all fragments of all the hoses evaluated (n = 12) and most of them were gram-negative rods. The bacterial load averages in hoses in use for one, three and 12 months were 54, 641 and 103 CFU, respectively. Bacterial load of 7/8 hose fragments evaluated after 12 months in use and 2/8 fragments of hoses evaluated after 3 months in use was >103 CFU. For the hoses in use for 1 month, the highest bacterial load was 137 CFU. Extent and thick biofilms were detected in the hoses in use for 12 months (Figure 1).

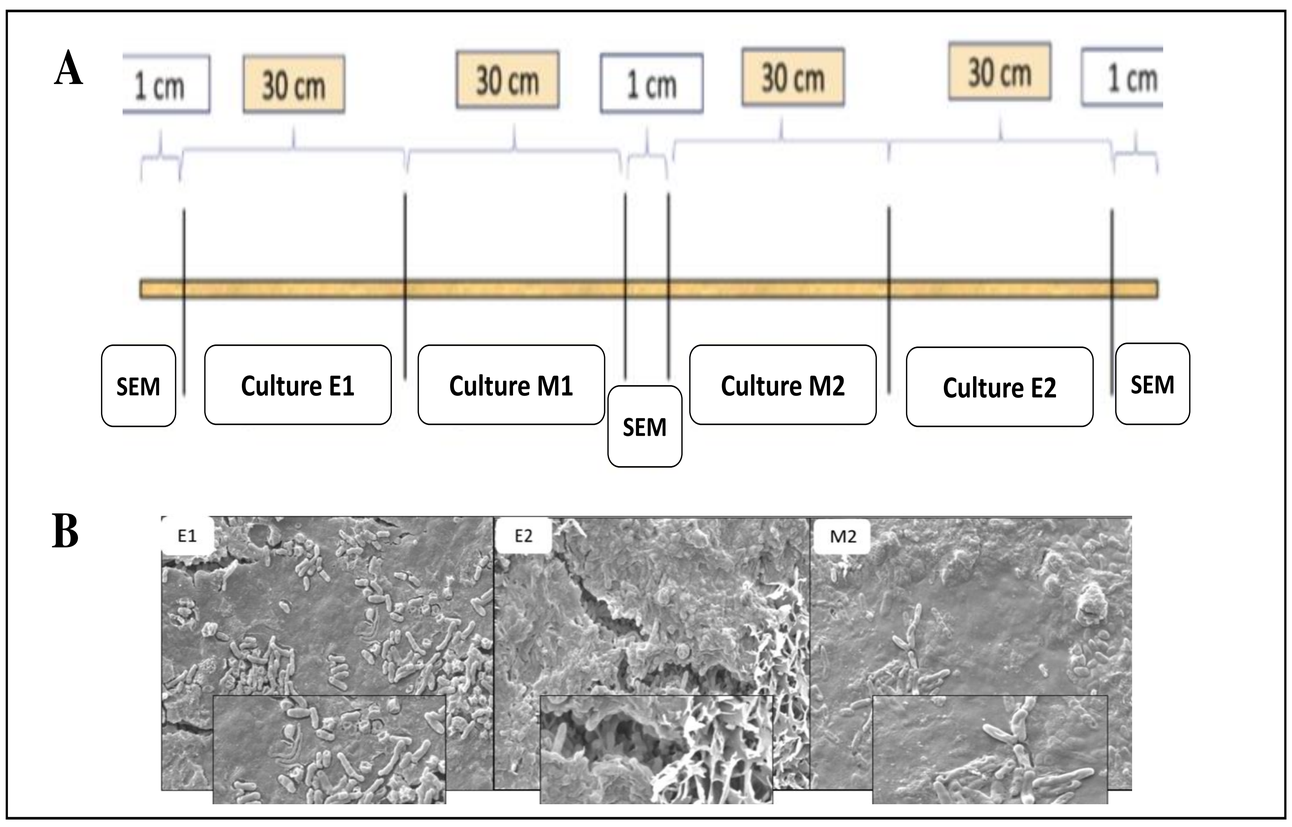

Figure 1. Hoses cutting scheme (A) and scanning electron microscopy images, of hoses inner (B). Soil and biofilm composed of rod/bacillus (E1, E2, M2) and cocci (E2) shaped bacteria.

CONCLUSION

High microbial load and presence of biofilm were detected in hoses of washer-disinfectors used for processing gastrointestinal endoscope in use in clinical practice, which may compromise the processing quality of these medical devices, mainly due to the risk of equipment (re)contamination during the final rinsing step, thus posing a risk to the patient safety.

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