Abstract:

Cross-infection in contrast injectors is still a subject under discussion with little understanding. This study evaluated the biosafety of non-return valves (NRVs). Initially, the maximum pressure during backflow of intact and disrupted flexible diaphragms (FDs) from NRVs, as well as the functionality of connectors with NRVs were verified. The performance of air columns interposed by water in connectors with NRVs was analyzed, and the diffusion distance of crystal violet through connectors with NRVs was measured. The efficacy of NRVs as a barrier to bacterial contamination from backflow was evaluated. Finally, a clinical study of bacteriological contamination from syringes was conducted. There were differences among the maximum tolerated pressure by intact and disrupted FDs. Disrupted FDs showed no failures in the functionality of connectors with NRVs based on the lack of air bubbles released. Air columns could move through connectors with NRVs with intact and disrupted FDs. The longest diffusion distance of crystal violet was 6 cm of connector length, and NRVs showed efficacy as a barrier to bacterial contamination. In the clinical study, there was no bacterial growth in any of the evaluated samples. In conclusion, biosafety depends on the functionality of NRVs as well as proper practical clinical performance.

Reference:

Azevedo, M., Monteiro, R. M., Castelani, C., Bim, F. L., Bim, L. L., Macedo, A. P., Oliveira, V. C. and Watanabe, E. (2020) Biosafety of Non-Return Valves for Infusion Systems in Radiology. Scientific Reports. 10(1), p.9574. https://doi.org/10.1038/s41598-020-66491-y.

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