

Cystic Fibrosis Research News

Title:

An evaluation of the disinfection process of nebulizers comprising steam disinfection process and drying process

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What was your research question?

In spite of disinfection bacteria are often found on nebulizers. This fact leads to the risk of infection. Therefore we investigated the crucial points of the complete disinfection process. We examined: 1, different steam disinfectors, and 2, different drying methods, in respect of bacterial contamination.

Why is this important?

In addition to time-consuming therapies, nebulizer maintenance takes up a lot of time. For infection prevention it is necessary to efficiently disinfect the nebuliser before every episode of inhalation therapy. For therapy adherence it is very important to make this disinfection process as simple and manageable as possible and therefore less time consuming.

What did you do?

We contaminated nebulizer parts with bacteria and mycobacteria that are typical in cystic fibrosis to find out the crucial points in the disinfection process where disinfection may be inefficient. At first we disinfected the contaminated parts using six different steam disinfection devices. After steam disinfection we determined the bacterial growth of swabs taken from the nebulizer parts. Then we tested the following drying methods: 1, active drying by using paper towels, as it is often practiced and 2, passive drying by leaving the parts in the steam disinfection device until the next use. Using the active drying method swabs were taken immediately after drying, using the passive drying method the swabs were taken at different time periods after completion of the steam disinfection.

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What did you find?

Steam disinfection is an efficient and safe disinfection method. All of the applied bacteria were efficiently killed in the six different steam disinfectors. The crucial point was the active drying method. Lots of bacteria, stemming from the hands of the involved persons were found but none of the applied bacteria. Using the passive drying method no harmful bacteria were found even after 96 hours.

What does this mean and reasons for caution?

This study leads to a completely unexpected turnabout regarding the importance of drying nebulizer parts. It is better to leave parts wet in the closed steam disinfecter without touching until the next inhalation (we recommend a maximum of 24 hours), than to touch parts by active drying and storing.

This study is only applicable for steam disinfection.

Good hand hygiene is an important part in good nebulizer hygiene.

The quality of the disinfection device is defined by its A0 value (, a physical parameter consisting of time and temperature denoting the inactivation of microorganisms in moist heat, which has to be above 3000 to guarantee bacterial kill

(<http://www.ncbi.nlm.nih.gov/pubmed/24741918>). This value should be declared by steam disinfection device manufacturers.

What's next?

The advantages of the passive drying method should be communicated to users. Active drying should be avoided. All manufacturers of nebulizers or airway clearance devices should declare if steam disinfection is possible and choose materials suitable for steam disinfection.

Manufacturers of steam disinfectors should declare the A0 value of the device.

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