STUDY OF THE RELATIONSHIP OF THE AIR FILTRATION PROCESS AS A FACILITATOR OF EXPOSURE TO MICROORGANISM INFECTION

Congresso Online de Microbiologia, 1ª edição, de 16/08/2021 a 18/08/2021
ISBN dos Anais: 978-65-89908-78-4

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RESUMO

Air filters play a key role as an integral part in the air conditioning system. The air filtration process has been associated with the occurrences of microbiological contamination of hospital and home environments, since the spread of bacteria and fungi occurs through particles loaded with microorganisms in the air. Therefore, it is necessary to evaluate methods that ensure good air quality as a form of non-pharmacological intervention in the prophylaxis of infections caused by etiologic agents that are dispersed in the air. The objective of this paper is to analyze the study of the relationship of the air filtration process as a facilitator of exposure to infection by microorganisms. An integrative review of current scientific articles was carried out. A collection of data from secondary sources was carried out, from the survey of bibliographic research on the subject. This search was conducted in the following databases: PubMed, where 47 results were obtained, initially using the filters "last 5 years" and "free full text", therefore, 7 articles were selected from the reading of titles; Scielo, from which of the 7 results, only one was selected; and finally, LILACS, which used the filter "last 10 years", obtaining 11 results, from which 2 were selected. From the search, a sample of 10 articles published in the period between 2011 and 2021 was obtained. Considering the working mechanism of air conditioning, which is to capture ambient air, cool it and deposit it on the surface again, it is observed the high probability of biological contaminants being conveyed. One of the studies evaluated 50 air conditioners, and it was found that only one was free of contamination of fungal or bacterial origin; in the other 49, the presence of *Bordetella parapertussis*, *Staphylococcus spp.* and *Actinomyces spp.* was identified, besides being observed characteristic signs and symptoms in the interviewed patients who circulated through the place. A study carried out in a pediatric dentistry office showed the presence of the genera *Aspergillus*, *Penicillium* and *Cladosporium* in the circulating air. In another study, a peak of fungal growth was observed in air conditioning filters between 04 and 05 days, with favoring at high temperatures. In one of the studies an increased number of bacteria and fungi was found in areas without Heating, Ventilating and Air Conditioning (HVAC) systems. In an analysis of buses with and without air conditioning systems, it was reported that the results did not clearly show that air conditioning is an additional source of contamination, as the differences were not statistically relevant ($p > 0.05$). When making a general evaluation based on the selected articles, it can be seen that there is a demonstrable relationship between facilitated exposure to microorganisms through the use of air conditioners, which leads to an increase in cases of diseases originating from the airborne transmission of fungi and bacteria. Since this is a common and globally used device, it is important to take measures to ensure the resolution of this impasse in order to avoid the transmission of possible diseases.

PALAVRAS-CHAVE: Air filtration, Contamination, Facilitator, Microorganisms

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