HOSPITAL INFECTION AND INDOOR AIR QUALITY

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RESUMO

Introduction: Artificial air conditioning systems installed in Health Care Establishments (HCE) aim to promote comfort for occupants. However, they are often not perceived as possible repositories and disseminators of biological agents. D'Orazio (2020) notes that contamination of air-handling units is a widespread phenomenon in buildings with air-conditioning systems, including hospitals. Shajahan (2019) records that dissemination to the circulating environment can be affected by many variables, such as air temperature, relative humidity, and ventilation rate. However, if not used correctly, they can contribute to the transmission/spread of airborne diseases, as proposed in the past for SARS-CoV-2. Brazilian Association of Technical Standards number 7256 (2021) highlights that one of the essential objectives of the facilities is to guarantee adequate air quality and to reduce the biological and chemical risks existing in the ambient air. Air treatment, although it is an important factor in reducing the risk of contamination in environments, must be considered a complement to other hospital infection control measures. **Objective**: Determine air quality indices in an air-conditioned hospital environment as a risk factor for hospital infection, as it can be a potential source of infection. **Methods**: The study was developed in a university hospital from the 1960s in Brazil. The selection of sample spaces was defined by the degree of criticality established by Technical Regulation of the Brazilian Health Regulatory Agency (Anvisa). The sampling consisting of fifty (50) points followed the protocols defined by Anvisa Resolution number 09/2003 collected from 2018 to 2023. The methods applied were Technical Standards (TS) 001; 002; 003 and 004. In TS 001, bioerosol analysis, the researchers used the 1 (one) stage Andersen sampler, petri dish, vacuum pump at 28.3 l/min and EMS rotameter. In TS 002, the concentration of carbon dioxide (CO_2) was measured with a gas analyzer and infrared sensor. Therefore, in TS 003, the dry bulb temperature, humidity, and air speed were checked with the anemometer instrument. Finally, for TS 004, the use of a vacuum pump and cassettes was used to measure aerodispersoids. All equipment used was previously calibrated before measurements. As it was an environmental assessment, approval from the Ethics Committee was not required. Statistical data was analyzed using the mean confidence interval. **Results**: From 2018 to 2023 it was

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found that the concentration of carbon dioxide changed in +>35% of the environments evaluated. The temperature and relative humidity of the air presented results +>10% above those recommended by RE 09. In relation to the variable aerodispersoids and air speed, they remained 100% within Anvisa parameters. In the internal fungi count, less than <1% are above the reference rates. Internal and external fungi registered >12% above of limits. **Conclusion**: In this study, we were able to demonstrate that permanent control and treatment of air-conditioned indoor air are important factors in reducing the risk of spreading contamination. The indicators are signs capable of strengthening the hospital institution's planning measures aimed at promoting the physical and mental well-being of its occupants. **Acknowledgments**: Professional Postgraduate Program in Human and Animal Health Biotechnology (PPGBiotec).

PALAVRAS-CHAVE: Hospital, Infection Control, Air Quality, Patient Safety

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