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MONITORING OF MICROBIAL BIOAROSOLS IN A METABOLIC AND DIETETIC KITCHEN OF A PUBLIC HOSPITAL IN PARAGUAY

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Introduction. The metabolic kitchen is a sensitive point within a hospital, so it must be free of potentially food-contaminating pathogenic microorganisms, hence the monitoring of bioarosols is an important tool for air quality control and the establishment of cleaning procedures. This work aimed to monitor fungal and bacterial bioaerosols present in the metabolic-diet cooking area of a public hospital in Paraguay.

Methodology. Petri dishes with the culture media water agar (AA), potato dextrose agar (PDA), nutritive agar (AN), malt salt agar (MSA), triptone soy agar (TSA), Czapek agar (CA) and sabouraud agar (AS) were exposed for 15 min at different heights within the metabolic kitchen, in each case by quintuplicate[1]. Humidity and temperature data were collected, as well as the number of people present in the room at the time of sampling. The plates were incubated at 25 °C. After 120 h a colony count was performed in each culture medium. With the results, the analysis of variance and the comparison of means was performed through Fisher's LSD with a 99.5% confidence interval between the amount of fungal and bacterial colonies present in the different culture media used, and the locations of the selected sampling points.

Results. Significant differences were found in the number of fungal and bacterial colonies in the different culture media ($p \leq 0.05$). The most effective medium for fungal capture was CA, followed by PDA; and the least effective was AN, followed by MSA. Significant differences were found between the number of bacterial colonies in different media ($p \leq 0.05$). PDA had the highest number of bacterial colonies, followed by TSA and AN; while CA, MSA and AS had the lowest number of bacterial colonies. Significant differences were observed for the number of fungi and bacteria present at the different sampling points ($p \leq 0.05$). The number of bacterial colonies was higher than the number of fungal colonies. The worktable 1 location is the point where the parenteral food is mixed for the patients, and it is the one that presented the highest mean amount of contaminating organisms, both fungi and bacteria. The laundry area presented the lowest average amount of fungal and bacterial colonies. The temperature in the room at the time of sampling was 21.6 °C and the relative humidity was 40%. A large number of bacterial and fungal propagules are capable of dispersing through the air, therefore the exposure to these potential pathogens must be controlled. For that, it is necessary to evaluate the composition and concentration of airborne microorganisms. Has been mentioned that its quantity and distribution within the different areas is related to different factors such as the orientation and number of the doors and windows, the type of ventilation system, the quantity and distribution of furniture, the type of activity carried out in that area and the quantity and movement of people. In a dietetic metabolic kitchen, the activity is intense and work is done with different types of food products that could be carriers of potential pollutants, which at the time of processing release particles. Care must be taken especially because food prepared in this kitchen is intended for patients who are in many cases immunocompromised and highly susceptible to the effects of these pathogens. For these reasons, monitoring for the presence of fungal and bacterial bioarosols helps to identify factors that can contribute to improving air quality and thus preventing hospital infections[2,3].

Conclusions. Fungi and bacteria were detected as environmental contaminants in the metabolic kitchen, with significant differences in the amount of fungal and bacterial colonies concerning the culture media used and the locations within the kitchen. The number of bacterial colonies counted was higher than the number of fungal colonies. The point of greatest contamination is above the worktable where the food is prepared.

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