

Indoor air in child homes related to selected home characteristic.

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In most countries around the world, people spend more than 80% of their time indoors, out of which a large part in their homes (Klepeis et. al., 2001). In the case of children and elderly people, this time is even longer. Thus, people breathe air which is mostly the air inside those dwellings. Therefore, the concentration of various pollutants in the air of homes has become an important factor in the individual exposure of most people, including children. Among the indoor air pollutants fungi are especially important. Indoor exposure to certain fungal genera is a risk factor for upper respiratory symptoms (cough, wheeze), asthma and allergy in both adults and children (Garrett et. al., 1998). The level of air pollution by fungi in homes is influenced by many different factors, including behavior and lifestyle of the inhabitants, construction and the finishing the rooms and the state of maintenance. Due to the multitude of factors affecting indoor air quality of dwellings, there is still a need for research in this direction.

The aim of this study was to assess the contamination of indoor air by fungi in child homes related to selected home characteristic (type of room and type of floor).

Materials and methods: Mycological analysis was carried out in 50 Polish dwellings, where up two-year old children were living, and outside buildings (background). All dwellings were located in urban agglomeration. In each child home the samples were taken in two rooms - in living room (LR) and in child room (CHR) - or in one room, when it was common for activities of adults and child (LCHR). The air samples were collected directly on Petri plates with Malt Extract Agar medium (5-10 min., air flow 20 l/min.) using Burkard Air Sampler. All samples were incubated 5 days in 30°C temperature. The quantitative and qualitative analysis of fungi were performed using the standard microbiological procedures. Qualitative identification of fungi was conducted to the level of five allergenic to human and most common in indoor air genera: *Penicillium*, *Aspergillus*, *Cladosporium*, *Alternaria* and *Stachybotrys*.

Results: The geometric mean of airborne fungi concentrations indoor child homes was 5.13×10^1 cfu/m³ (range: $2.5 - 5.31 \times 10^2$ cfu/m³) and outdoor was 9.32×10^1 cfu/m³ (range: 1.50×10^1 cfu/m³ - 3.87×10^2 cfu/m³). The concentration of fungi in the air of any dwelling did not exceed the reference value for the home environment (5.0×10^3 cfu/m³, Górný, 2004).

Concentrations of airborne fungi in the CHR amounted to on average 4.38×10^1 cfu/m³ and was slightly lower than in the LR (GM= 5.79×10^1 cfu/m³) and the LCHR (GM= 5.78×10^1 cfu/m³). The levels of fungi concentration

in the air in various types of rooms did not differ significantly ($p > 0.05$). Taking into account the type of floor the lowest geometric mean of airborne fungi concentrations was observed in a room where the floor was covered with carpet or carpet lining (3.18×10^1 cfu/m³). The geometric mean of airborne fungi concentrations in rooms with smooth floor (floor covered with panels, parquet or terracotta) and with mixed floor (panels or parquet with rug or carpet) was similar and amounted to 5.24×10^1 cfu/m³ and 5.56×10^1 cfu/m³, respectively. Statistical analysis showed that the type of floor had no significant influence on the level of fungi concentration in the air of child homes ($p > 0.05$). In any of the examined dwellings were detected airborne fungi of the genus *Stachybotrys*. Allergenic fungi of the genera *Penicillium*, *Aspergillus*, *Cladosporium* and *Alternaria* constituted on average in the indoor air of child homes and in outdoor air 65.63% and 47.54% of all fungal aerosol, respectively. Indoor and outdoor air was dominated by *Penicillium* genus with average 42.11% and 20.74% share, respectively. In 40% of indoor air samples was present *Aspergillus fumigatus* species qualified to the 2 class of biological agents potentially hazardous for people according to the BSL classification (de Hoog, 1996).

Conclusions: 1. The concentrations of airborne fungi indoor child homes were low and did not exceed the Polish reference value for the home environment (5.0×10^3 cfu/m³, Górný, 2004). 2. Type of room and type of floor in the homes of children did not modify significantly the concentration of fungi in indoor air. 3. Mycological pollution of indoor air in dwellings was associated most with the presence of fungi allergenic to humans. 4. Among identified airborne fungi in child homes, was present *Aspergillus fumigatus* species qualified to the 2 class of hazard (BSL classification).

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