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‹ Previous Issue | Next Issue ›

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## ISSUE INFORMATION

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First Page | Full text | PDF | Request permissions

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First Page | Full text | PDF | Request permissions

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First Page | Full text | PDF | Request permissions

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Abstract

Pages: 424-582 | First Published: 15 November 2021

First Page | Full text | PDF | Request permissions

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Abstracts

Pages: 583-637 | First Published: 15 November 2021

First Page | Full text | PDF | Request permissions

## ABSTRACTS LB TPS

Free Access

Abstracts

Pages: 638-661 | First Published: 15 November 2021

First Page | Full text | PDF | Request permissions

## AUTHOR INDEX

Free Access

Author Index

Pages: 662-693 | First Published: 15 November 2021

First Page | Full text | PDF | Request permissions



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- EAACI Events Calendar
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levels of cytokines (TSLP, IL25 (17E), IL33, IL4, IL5, IL13), measured with multiplex assay, was assessed.

**Results:** An increase in the average annual concentrations for the total suspended particles and PM10 fraction, as well as an increase in the maximum concentrations for the total suspended particles, PM10 and PM2.5 fractions was shown.

An analysis of the joint database combining environment pollution data and the unified state information system on population health showed a tendency towards an increase in the number of new cases of mixed BA in adults (18–65 years) with an increase in the average long-term concentrations, the long-term 95th percentiles and the maximum long-term concentrations of suspended particles both for the total fraction and PM10 and PM2.5 fraction among the population living in the territories close to the monitoring points. Based on the study of the relationship between biological markers of BA (IgE, IL13) and environmental exposure of suspended particles, the important role of the fine particles (PM2.5) was shown.

**Conclusion:** Thus, the results obtained showed that air pollution with suspended particles may increase the risk of developing mix BA (J45.8) phenotype of BA.

### 708 | Fungal spores as more significant airborne factor than previously recognized

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**Background:** Fungal spores can cause both seasonal and perennial allergy and provoke asthma attacks especially in autumn, when pollen levels are low but amounts of spores including *Alternaria* and *Cladosporium* are abundant in Ukraine.

**Method:** Spore collection from 2009 to 2019 used volumetric methods employing a Burkard trap placed at a height of 25 meters above the ground on the roof of a Vinnitsa Medical University, Ukraine. Samples taken from February until November were analyzed by mean of three horizontal transects in years 2009–2011 and by mean of twelve vertical transects at a bi-hourly mode in years 2012–2019 under the light microscope with x400 magnification. Sensitizatnion was assessed by 8016 ALEX tests performed in different regions of Ukraine in 2017–2019in patients from 1 to 78 years old.

**Results:** 62.4 % of ALEX-tested individuals in Ukraine were sensitive to fungal allergens, most notably *Alternaria* ranging from 4.6 % to 33.3 % of tested individuals especially in Southern and Central regions of the country. Sensitization to Cladosporium ranged from 1.4 % and 22.2 % being greatest in Western and Northern Ukraine. Long-term trends of both *Alternaria* and *Cladosporium* season duration showed tendency to prolongation as in 2019 *Alternaria* had >100spores/$m^3$ through all June until the end of October while *Cladosporium* had >2500 spores/$m^3$ noted from mid May until early November.

**Conclusion:** Fungal spores induce seasonal allergy in Ukraine during the summertime and autumn with climate change inducing elongation of spore seasons.

### 802 | Negative impact of air pollution on nasal diseases in South Korea

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**Background:** Air pollution negatively influences public health, especially respiratory health. Since nose is the first gate of respiratory tract, several nasal diseases might be developed and/or be aggravated according to level of air pollution. This study investigated the impact of air-pollution for four nasal diseases, such as common cold, allergic rhinitis (AR), acute and chronic rhinosinusitis (ARS and CRS).

**Method:** In the study, patient data were extracted from Korean health Insurance Review & Assessment Service. The data contained anonymized medical records of patients who were diagnosed of the four nasal diseases from 2016 through 2018 in Korea. Meteorological factors, such as precipitation, wind, temperature, and humidity, were collected from Korean meteorological administration. Levels of major air pollutants, such as SO2, CO, O3, NO2, PM10, and PM2.5 were derived from AirKorea. All of data were divided into 16 provinces of Korea.

**Results:** For 1,096 days, total 122,394,790 medical record were reviewed; there were 58,251,145 male and 64,143,645 female patients. Young adults (19–44 years old) were the most frequent patients visiting hospitals for the nasal diseases. The prevalence of the nasal diseases were 8.1/1000 for common cold, 11.1/1000 for AR, 7.8/1000 and 3.1/1000 for ARS and CRS. In multivariate analysis, O3, NO2, and PM10 elevated risks of the nasal diseases; PM10 especially for AR and ARS (OR 5.9 with $p < 0.001$ and OR 5.7 with $p < 0.001$) and NO2 for CRS (OR 8.1 with $p < 0.001$).

**Conclusion:** Air pollution could give significantly negative impact on several nasal diseases. Ambient air pollution should be considered when medical resources were allocated. In addition, health care provider should prepare the increase of patients with nasal diseases as air pollutants increase.