UDC: 614.7:544.772(477-21)

ULTRAFINE PARTICLES MONITORING IN CHERNIVTSY: EXPERIENCE AND CHALLENGES

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Introduction. In 2021, a group of WHO experts developed new recommendations on ambient air quality, which for the first time formulated very important provisions on measures to reduce the concentration of ultrafine particles (UDF) in the environment. It is important that the results obtained by us in the international project 3CE288P3 (DVR:0000191, V349) of the joint program "Central Europe" called "UFIREG" (Ultrafine Particles — an evidence-based contribution to the development of regional and European environmental and health policy) were taken into account to substantiate these provisions.
Purpose of the study. Introduction in Ukraine of a new methodology for measuring the amount of UDF and assessing the risk of their impact on public health based on the current array of information received during 2013-2020.
Material and methods. The SMPS spectrometer, which was used within the framework of the UFIREG project, is capable of measuring in 8 intervals (10-800 nm) with a possible measurement range of 1000-100 thousand km. particles in cm^3.
Results. We have formulated the main methodological principles for identifying the relationship between the quantitative concentration of UDF in the air and the state of public health according to the data of 8-year monitoring. The average concentration of the total amount of UDF in the atmospheric air of Chernivtsi for the period 2013-2020 was 9000 pcs/cm^3. Its most pronounced increase was observed due to an increase in emissions in the heating season, with the exception of 2018, where the opposite trend was detected. A statistically significant increase in the total amount of UDF and individual fractions of different diameters was observed in the autumn-winter period. The most pronounced changes were found for particles with a size of 10-20 nm and 200-800 Nm. The analysis of the average daily concentrations of UDF during the week made it possible to establish their lowest values on Thursday in summer, and the highest on Wednesday and Friday in winter. The maximum medium-diurnal concentrations on some days of January and February were 18000-20000 pcs/cm^3.
Conclusions. According to the data of 8-year monitoring, on the basis of the identified temporal regularities of the influence of meteorological factors on the formation and entry into the atmospheric air of Chernivtsi of UDF with a size of 10 to 800 nm, approaches to assessing their exposure, modeling the choice of confounders and determining the lag structure during epidemiological studies have been improved. It has been proposed to consider the level of the total amount of UFP (10-800 nm) 1000 pcs/cm^3 low, and 10000 pcs/cm^3 high.

Keywords: *ultrafine particles, atmospheric air, monitoring.*