

ASSESSMENT OF ENVIRONMENTAL CONDITIONS IN TASHKENT AND RELATIONSHIP WITH THE POPULATION SUFFERING FROM CARDIOVASCULAR DISEASES

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Abstract

To study the health status of the population suffering from cardiovascular diseases, taking into account the degree of atmospheric air pollution with nitrogen compounds, to develop preventive measures (on the example of Tashkent). To achieve this goal, 4 interrelated tasks were solved. During the scientific research, the atmospheric air and the health of the population of the city of Tashkent were chosen as the object. The subject of the study was the levels of atmospheric air pollution with nitrogen compounds and cardiovascular diseases of the population (on the example of Tashkent).

Keywords: Atmospheric pollution, atmospheric air, environment, nitrogen compounds, monitoring, cardiovascular diseases, population, health, mortality among the population, prevention.

Introduction

Relevance of the problem. Currently, the majority of humanity simply treats generous gifts of nature as consumers, destroying what the planet has been saving for millions of years. Recent studies suggest that polluted environment is one of the important factors determining changes in the health of the urban population. It has been established that all types of pathology are much more common in ecologically polluted areas; out of 19 classes of diseases, 53% of nosological forms of diseases in the population show a reliable connection with the content of pollutants in the environment, in particular in the atmospheric air (Kireev G.V. et al., 2008). Among the diseases associated with air pollution, most researchers highlight diseases of the respiratory system (34.4-35.8%), the nervous system (9.5-10.8%), and the hematopoietic system (8.3-9.5%). Pollution of atmospheric air with suspended substances alone can be the cause of up to 21 thousand

additional deaths per year from respiratory and circulatory diseases (Ponomareva L.A. et al., 2009, 2010, 2011).

Pollutants entering the atmosphere from stationary and mobile sources can create high concentrations not only at the emission site (industrial site, locations of large transport hubs and highways, etc.), but also spread beyond the sanitary protection zone, including residential areas. The content of the main pollutants in the air basin of a city depends not only on the size of the settlement and its industrial potential, but also on the physical and geographical features of the territory (relief, meteorological conditions, etc.), as well as the layout of populated areas.

All of the above applies to a large extent to the city of Tashkent, which is not only the capital of the Republic of Uzbekistan, but also the largest administrative city of the republic with a population exceeding 2.5 million people. Due to air pollution, the incidence of chronic non-specific diseases of the bronchopulmonary system increases, and cardiovascular diseases become more severe.

Objective of the study: to study the health status of the population suffering from cardiovascular diseases, taking into account the degree of air pollution with nitrogen compounds, and to develop preventive measures (using Tashkent as an example).

To achieve this goal, the following tasks were solved:

1. To provide a comprehensive hygienic assessment of environmental conditions in Tashkent over the past 3 years, taking into account the levels of air pollution with nitrogen compounds.
2. To analyze the level and dynamics of cardiovascular disease in Tashkent over the past 3 years.
3. To provide recommendations for developing preventive measures aimed at reducing the incidence of urban population based on environmental factors.

Research materials and methods

Analytical methods for studying the content of nitrogen compounds in atmospheric air. The volume of research conducted and the choice of methods were determined by the need to characterize the impact of nitrogen compounds polluting the environment on the health of the population suffering from cardiovascular diseases.

The studies were conducted during 2021-2023 at the bases of the Department of Ecology and Environmental Protection of the city of Tashkent, the Research Institute of Public Health and the Organization of Healthcare Department of Tashkent. Based on the data obtained, an analysis was made of the relationship between cardiovascular diseases and the degree of air pollution with nitrogen oxides.

During the research work, the object chosen was the atmospheric air and health of the population of the city of Tashkent. The subject of the study was the levels of air pollution with nitrogen compounds (NO₂ and NO) and cardiovascular diseases of the population (using the city of Tashkent as an example).

The methodological basis was analytical, mathematical and statistical approaches.

When deciding on the choice of territories for observations, it is necessary to proceed from the fact that they should differ in nature and degree or only in the degree of air pollution and should not differ in the level of provision of the population with medical care, its specialization and organization, as well as in the main socio-economic indicators. The total number of such territories depends on the nature of the settlement in which the study is carried out.

Methods for studying the health status of the population suffering from cardiovascular diseases. Considering that data on the health status of the population can be obtained on the scale of at least one polyclinic, the size of such a territory should be close to the size of the territory served by this medical institution. In order to select observation areas, it is necessary to conduct a preliminary sanitary survey of the territories to fully account for sources of air pollution.

When selecting contingents, the entire population can be taken for observation, but the minimum number of individuals in a group must be at least 25 thousand, otherwise the data taking into account gender and age characteristics will be unreliable. If observation is carried out over a large area where a large number of people live, then a sample population (observation contingent) is formed, whose health will be studied. To determine the number of sample groups, a sample size is established that ensures the reliability and validity of the results based on the use of formulas known in sanitary statistics for determining the permissible error of the indicator. The advantage of the sample method compared to the continuous method is the rapid receipt of sufficiently reliable results.

Data on population morbidity are also an objective indicator of the level and changes in health status and one of the main criteria for assessing the population's response to the adverse effects of polluted air. Population morbidity makes it possible to study both the long-term (chronic) and short-term (acute) effects of atmospheric pollution. Population morbidity is studied by copying all cases of diseases in adult and child contingents, both based on the materials of requests for medical care and on the results of medical examinations. In other words, monitoring of selected contingents is carried out according to the type of statistical or epidemiological study.

Prospective studies observe exposed and unexposed groups (cohorts) of individuals. Such studies identify only new cases of disease. Retrospective studies are conducted by comparing the distribution of etiologic factors in patients (experimental group) and healthy individuals (control group). In this case, scientific research is conducted in the direction from effect to cause.

The analysis of the results of studies of the health status of the population is based on the use of mathematical and statistical methods that take into account the method of forming contingents, the possibilities of computer processing, mathematical modeling and forecasting. Modern mathematical and statistical methods of analysis make it possible not only to establish the fact of the existence of a connection between changes in health status and air pollution, but also to determine the quantitative dependence of this connection with the allocation of individual pollutants by significance that affect health.

Taking into account the above, we have carried out an extract of case histories of patients with cardiovascular pathology in Tashkent for the last 3 years, and studied the dependence of the frequency of patient visits on the season and the degree of air pollution with nitrogen oxides. Based on the data obtained, a correlation and regression analysis of the relationship between cardiovascular diseases (per 10,000 population) and the degree of air pollution with nitrogen oxides was carried out. The development of data on morbidity was carried out on the basis of the existing "International Classification of Diseases, Injuries, and Causes of Death, 10th Revision" (1995). The obtained data were statistically processed with the determination of average values.

Conclusion

Today, it is relevant to identify quantitative dependencies of the general morbidity of the population of large cities on various levels of polluted atmospheric air, which can be a pathogenetic mechanism for the development and progression of common diseases, including cardiovascular diseases. In the structure of the considered environmental pollutants, emissions of nitrogen oxides are of no small importance. The modern mathematical and statistical methods of analysis used in this study make it possible not only to establish the fact of the presence of a connection between changes in health and air pollution, but also to determine the quantitative dependence of this connection with the allocation of individual pollutants affecting health by significance.

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