

SOME ANTHROPOLOGIC-ECOLOGICAL CAUSES OF TUBERCULOSIS DISEASE RATE IN THE CITY OF MAKHACHKALA

Candidate of biology, associate professor Daniyalova P.M., Department of medical biology of Dagestan state Medical University

Candidate of biology, assistant Aliyeva K.G., Department of medical biology of Dagestan state Medical University

Summary The article studies a relation between tuberculosis of breath organs disease rate with factors that characterize ecological condition of atmospheric air in the city of Makhachkala.

Key words: tuberculosis, atmospheric air, benzopyrene, lead, weighed substance, nitrous oxide, index of atmospheric pollution, epidemiological situation.

The objective of this research is to evaluate anthropologic-ecological condition of atmospheric air in the city of Makhachkala and study its effect upon indexes of tuberculosis disease rate during the analyzed period (2013-2015).

Materials and methods of research: According to the objective of this research collection and analysis of data, received from Republican anti-tuberculosis hospital and Dagestan center of hydrometeorology and environment of Russian hydrometeorological center, has been organized.

Analysis of the received data implied calculating index of atmospheric pollution (IAP) according to the formula:

$IAP = (q \text{ average} / UAC)^c$, while $c = 0,9; 1,0; 1,3; 1,7$ for substances of danger class 4, 3, 2, 1.

According to the received data a complex index of atmospheric pollution (CIAP) was calculated for 4 pollutants (weighed substance, carbon oxide, sulphur dioxide, nitrous dioxide) during the period of 2013-2015. Additionally, CIAP was calculated for the same pollutants in sum with benzopyrene and lead in 2013-2014.

CIAP index below 5 corresponds to a low level of pollution, 5-7 – to increased level, 8—14 – to a high level, over 14 – to extremely high level.

All operations were carried out with computing facilities via programme applications Excel and MathCad.

Research results: Analysis of the reports on environment condition during 2013-2015 [7, p. 304-311] demonstrated that regardless of decrease in volume of industrial production and intensification of nature-preserving activity by the corresponding authorities, problem of pollution remain especially urgent in the city of Makhachkala [4, p. 18-21]. The main

contribution into discharge is made by enterprises of the following sectors: for solid substances – production of construction materials, for benzopyrene, lead, and hydrocarbon, carbon oxide, and nitrous oxide – automobile transport and heat power, for sulphur dioxide – enterprises of material-technical provision. Industrial enterprises that pollute atmospheric air are mostly concentrated in Southern and Northern industrial areas. [8, p.151-156].

Table 1. Indexes of average aerial pollutants level in Makhachkala

Polluting substance (aerial pollutant)	2013 r.		2014 r.		2015 r.	
	IAP	UAC	IAP	UAC	IAP	UAC
Weighed substance	0,50	0,15	0,56	0,15	0,59	0,15
Carbon oxide	0,020	3,0	0,030	3,0	0,018	3,0
Nitrous dioxide	0,06	0,04	0,05	0,04	0,05	0,04
Sulphur dioxide	0,003	0,005	0,004	0,005	0,003	0,005
Benzopyrene	1,9	1,0	1,3	1,0	Data in procession	
Lead	0,00155	0,0003	0,0112	0,0003		

Content of carbon oxide and hydrocarbons in atmospheric air prevails over content of other pollutants. Table 1 represents contents of polluting substances in atmospheric air that proves domination of carbon oxide, hydrocarbon, carbon dioxide in atmosphere of the city.

Bibliographic sources [1, p. 49-51, 3, p. 9-13, 5, p.179-182, 6, p. 9-13] contains evidence of pathologic impact of aerial pollutants upon breath organs or immunity. Thus, nitrous dioxide (NO₂) makes a person more vulnerable against pathogens that cause breath tract diseases. Effect of sulphur dioxide upon a person leads to increase in total rate of death, caused by disease of breath organs. Even in small concentration carbon oxide is a potentially toxic gas. We can suppose that breath organs, weakened by impact of these substances, are more vulnerable to tuberculosis infection.

There are works for Makhachkala [2, p. 3-13] that contain a developed methodic of evaluating air pollution and its influence upon epidemiological situation. Significance of complex pollutant group evaluation in establishing real causes of disease rate change is underlined.

Epidemiological situation of tuberculosis in Republic Dagestan in 2014 had a consequent positive trend in comparison to 2013. It is possible that certain improvement of epidemiologic situation according to tuberculosis in 2014 was related to implementation of targeting programme “Preventing and fighting socially-significant diseases in Republic Dagestan” and

subprogramme “Fighting tuberculosis in Republic Dagestan for 2013-2017”, included into the programme “Development of healthcare in Republic Dagestan for 2013-2017”.

Results of such complex researches have a significant influence in solving theoretic question of prevention medicine as well as in practical measures of decreasing epidemiologic tension that is important in predicting real consequence for health of population.

Bibliographic list:

1. Analyzing risks for population health from impact of various ecologic factors in the area of Siberian chemical complex / I.I. Linge, S.M. Novikov, T.A. Shashina and others // Hygiene and sanitary, 2007, №5, p. 49-51.
2. Golikov R.A. Characteristic of health risk from discharges and dumps in terms of restructuring industry of a big city. Author’s abstract for candidate of medicine, 2015, p. 9-13.
3. I.A. Mamayev Influence of ecologic factors upon spread of tuberculosis: dissertation for doctor of medicine, 2005, p.18-21.
4. O.B. Perova, L.P. Agulova, L.P. Volkotrub Relation between tuberculosis of breath organs disease rate in Tomsk region and ecologic and social-economic factors // Messenger of Tomsk state university, 2013, №370, p. 179-182.
5. E.N. Streltsova Influence of unfavourable ecologic factors upon breath organs // Tuberculosis and lung disease. 2007, №3, p. 3-7.
6. Condition of population health in Republic Dagestan in 2014. Makhachkala, 2015, p. 304-359.
7. A.V. Ryabova A.G. Gasangadzhiyeva, Z.Y. Gadzhiyeva Ecologic-epidemiological features of malignant formation disease rate in the city of Makhachkala, Republic Dagestan // South of Russia: ecology, development, №3, 2009, p. 151-156.
8. <http://www/ecologyandus.com>
9. <http://www.euro.who.int/ru>.