

TRAFFIC-RELATED AIR POLLUTANTS EXPOSURE AS A RISK OF OBSTRUCTION

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Dynamic growth in the number of vehicles, particularly in large urban areas, causes a noticeable decrease in the average traffic speed. Road networks are not able to efficiently handle generated traffic, which could result in increasing levels of air pollutants emission and thus in a greater incidence of people suffered from respiratory diseases. In 2005-2006 and 2008-2009 in two Polish cities (Warsaw and Gliwice), respiratory function tests were conducted on a group of 3,506 people (including residents of non-urban areas). The investigation has shown that among people living near busy urban roads, in comparison to rural areas inhabitants, there is a statistically significant, specific increase in the risk of the bronchi obstruction. It should also be added that there has been demonstrated significantly higher concentrations of traffic-related air pollutants in urban areas in comparison to rural areas.

The analysis of the pulmonary test results, carried out by Warsaw University of Technology and Military Institute of Medicine, was based on logistic regression models. Average values of selected spirometric parameters were calculated as well as the percentage of individuals with airways obstruction. Bronchial stricture was diagnosed, when the FEV1%FVC factor was lower than 70%. Degrees of airways obstruction were qualified according to GOLD guidelines.

The research showed that the risk of disturbance in airflow through the bronchi was significantly associated with smoking (more than 2 times higher in the Warsaw study and over 1.6-fold higher in the Gliwice study), as well as with exposure on traffic-related air pollutants associated with living along busy roads. Among inhabitants of Warsaw living in the proximity of main roads there was reported nearly 2.8-fold higher and amid residents of Gliwice more than 2 times higher risk of bronchial obstruction in comparison to those residing in non-urban areas. In addition, studies carried out in Gliwice, showed a 3% increase in risk of obstruction with every successive year of life in a vicinity of a busy street. Increased risk of airways obstruction associated with life expectancy in rural areas was not observed. Examined population had been divided into two groups according to smoking habit. Non-smoking persons, living in the vicinity of busy roads are visibly more strongly exposed to the occurrence of breathing disorders in comparison to non-smokers in rural areas (4 times higher risk was noticed in Warsaw and over 3 times higher in Gliwice). Among smokers however all

independent variables in the logistic model, linked with place of residence, proved to be insignificant.

The results quoted in the study indicated a possibly significant role of air pollutants in causing bronchial stricture diseases (mainly COPD). Statistically significant differences in average values and percentages of persons with bronchial obstruction between rural area inhabitants and those living in the proximity of roads indicated a potential influence of traffic-related pollutants. This fact is partly confirmed by the logistic models, which proves that the probability of bronchoconstriction appearance is higher among smokers and elderly people. Above all, it suggests the increase of COPD suffering risk with degree of exposure to traffic-related air pollutants.