

LUNG FUNCTION IN CHILDREN OF UPPER SILESIAN INDUSTRIAL ZONE, POLAND: RESULTS OF THE CROSS-SECTIONAL STUDY IN TWO TOWNS OF DIFFERENT AMBIENT AIR POLLUTION LEVELS

J. E. Zejda¹, M. Skiba¹, I. Mensink²

¹Department of Epidemiology, Institute of Occupational Medicine and Environmental Health in Sosnowiec, Poland

²Department of Epidemiology, University of Wageningen, The Netherlands

SUMMARY

In two groups of children aged 7-9 years residing in two towns in the most industrial region of Poland, Chorzów (C - "higher air pollution") and Mikołów (M - "lower air pollution"), lung function testing was performed in a cross-sectional manner in order to examine if the spirometric indices in children depended on the ambient air pollution level as assessed by area measurements. The between-town difference in ambient air quality was statistically significant with respect to particulate and gaseous pollutants (SO₂ and NO₂). In Chorzów 855 and in Mikołów 356 children were studied. Both groups (C and M) were similar in terms of sex, age, height and weight. In boys, the group mean values of lung function indices (in % of predicted values) were for FVC: C-98.1, M-98.0; FEV₁: C-109.5, M-107.8; PEF: C-84.3, M-80.0 ($p < 0.05$); MEF₅₀: C-105.5, M-100.4 ($p < 0.05$); MEF₂₅: C-100.5, M-93.7 ($p < 0.05$). In girls, the respective values were for FVC: C-100.4, M-100.3; FEV₁: C-107.6, M-107.1; PEF: C-78.4, M-77.6; MEF₅₀: C-103.5, M-104.2; MEF₂₅: C-97.6, M-99.9. Stratification for the presence of respiratory symptoms or exposure to environmental tobacco smoke did not change the between-town differences in boys' lung function. The findings were confirmed by the results of multivariate analyses. The study did not provide evidence that children living in Chorzów had poorer lung function compared with children living in Mikołów. The results highlight problems regarding a cross-sectional approach to the investigation into the effect of ambient air pollution on lung function, such as the study design, the validity of exposure assessment by means of stationary monitoring, the subjects' age and sensitivity of the evaluation of lung function.

Key words: air pollution epidemiology, lung function, children, cross-sectional study

Address for correspondence: J. E. Zejda, Institute of Occupational Medicine and Environmental Health, Ul. Kościelna 13, 41-200 Sosnowiec, Poland