Background: Long-term effects of air pollution on lung function remain uncertain particularly for adults.

Aims: To investigate the association between exposure to nitrogen dioxide (NO$_2$) – used as a marker for local traffic-related pollution - and particulate matter <10 microns (PM$_{10}$) in the urban area of Grenoble (France) and lung function in adults.

Methods: Lung function parameters (FEV$_1$, FVC and FEV$_1$/FVC$\%$ predicted assessed using the Stanojevic equations) were assessed between 2001-2007 for 450 adults living in Grenoble (120 asthmatics and 330 non asthmatics), in the frame of the follow-up of two epidemiological studies, EGEA (Epidemiological study on the Genetics and Environment on Asthma) and ECRHS (European Community Respiratory Health Survey). The annual means of NO$_2$ (2004) and PM$_{10}$ (2008) levels were estimated at the home addresses using a dispersion model and were combined to time-specific measures from the permanent air quality monitoring stations to capture temporal variations in exposure (the year before the lung function measurement). Linear regression models were stratified by asthma and adjusted for sex, age, BMI, active and passive smoking, occupational group, atopy, study and for asthmatics inhaled corticosteroids.

Results: Medians concentrations ($\mu$g/m$^3$) were 34 (IQR 31-38) for NO$_2$ and 31 (IQR 29-33) for PM$_{10}$. In non asthmatics, for a 10$\mu$g/m$^3$ increase in NO$_2$ and PM$_{10}$, FVC$\%$ predicted decreased by 3.7 (p=.01) and 11.7 (p=.03) and FEV$_1$% predicted by 3.3 (p=.02) and 9.0 (p=.07) respectively. Similar but not significant negative trends were observed in asthmatics.

Conclusion: Results suggest negative associations of home outdoor NO$_2$ and PM$_{10}$ with lung function in non asthmatics.

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