

470. Smoking tobacco: from second hand to earthquake

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Role of genetic factors on smoking habits and secondhand smoke sensitivity: A twin study

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Introduction: The role of genetic factors on nicotine dependence, withdrawal and quitting is well understood, however no information is available on secondhand smoke (SHS) exposure sensitivity. Our aim was to assess SHS exposure, smoking habits and characteristics, smoking regulations at home, during driving and at workplace of monozygotic (MZ) and dizygotic (DZ) twins, and the contribution of genetic factors to SHS sensitivity.

Methods: 161 Hungarian and 50 American adult twin pairs (151 MZ and 62 DZ; mean age 44±17 years±standard deviation/SD) were recruited in this classical twin study.

Results: The overall rate of current, ex and never smokers was 14.6%, 16.4% and 69.2%. MZ twins reported higher rate of everyday and regular smoking for at least one year ($p<0.05$). 88% of MZ twins were both ex or current smokers, while the number was 70% in DZ twins ($p<0.01$). Significantly higher concordance was found in the disturbing effect of secondhand smoke in MZ versus DZ pairs (58 to 94% versus 39 to 79%, $p<0.05$ to $p<0.005$) on a self-reported smoke pollution scale between 1-7. Significantly smaller difference was observed in self-reported smoke pollution rate in MZ twins compared to DZ pairs concerning the restaurants and cafés (1.2 ± 1.3 vs 1.8 ± 1.5 , $p<0.05$) which was not present regarding restaurants and cafés and transportation facilities.

Conclusions: In conclusion, this study estimated a genetic influence on smoking habits and secondhand smoke sensitivity especially in smoke pollution rate of restaurants and cafés.

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The effect of passive smoking on body height, body weight, peak expiratory flow rate and motor skills in children

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Passive smoking is strongly linked to a range of adverse child health outcome. The objectives of the present study were to assess: 1) proportion of school children passively exposed to cigarette smoke; 2) the impact of passive smoking on body height and body weight; 3) the influence of passive smoking on peak expiratory flow rate (PEFR); and 4) on the motor skills in school children.

This prospective study included 133 children, 66 males and 67 females, aged from 11 to 14 years. Subjects were divided in two groups depending on parental smoking habits: Group I – children of smoking parents who smoke 10 or more cigarettes per day (88/133=66%) and Group II – children of non-smoking parents (45/133=34%). For the assessment of motor skills 6-minute run test (F-6 test) was used.

88/133 (66%) children have been exposed to passive smoking, while 45/133 (34%) children came from families of non-smoking parents. There was no statistically significant difference in either height or in weight. The PEFR (L/min) values for Group I were statistically lower [320 (300-370)] than in control group of children [380 (347-405)] ($P<0.0001$). The median F-6 test values for Group I were statistically lower [2 (1-3)] than in control group of children [4 (3-5)], respectively ($P<0.0001$). Children of smoking parents have statistically significant lower grade of motor skills and statistically significant lower PEFR value than children of non-smoking parents. Public health preventive actions should go toward minimizing the exposure of children to passive smoking by counseling the smoking parents that quitting smoking provides enormous health benefits not only to them but also to their children.

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Assessment of alveolar clearance with technetium-99m-DTPA radio-aerosol in patients who are active, passive and former smokers; preliminary study

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Objective: Smoking is the most important risk factor for pathological changes such as increased inflammation of lungs, fibrosis of airway wall and destruction of

alveolar barriers. Recent studies show strong relationship between passive smoking and pulmonary diseases. In our study we investigate alveolar clearance levels in active, passive and former smokers with technetium-99m-DTPA radioaerosol inhalation scintigraphy.

Methods: 82 patients with smoking related complaints to chest disease clinic were taken in study. 52(63.5%) were female and 30(36.5%) were male. Mean age was 51.3(±13). Patients were divided into three groups as active, former smokers and passive. Patients who never smoked and did not expose to passive were accepted as control group. Also patients were divided into subgroups as copd, asthma and healthy. In control group smokers 7(17%), nonsmokers 14(34%) and passive were 20(41%). Mucociliary clearance were evaluated with parameters of T1/2, cap value ve penetration index.

Results: A significant difference was stated in healthy group between smokers and passive ($p=0.05$) and between smokers and nonsmokers ($p=0.04$). Also a significant difference was determined in patients of copd and asthma in terms of T 1/2 ve cap values between smokers with passive(0.04) and former smokers($p=0.02$). There was no significant difference between former and passive smokers.

Conclusion: Our study shows that smoking disrupts alveolo-capillary membrane function and increases mucociliary clearance. In the presence of comorbid disease only active smoking increases clearance. There is also increased clearance in passive smokers compared with nonsmokers.

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The relationship between pulmonary function tests and gender among smokers with no respiratory symptoms

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Aim: In some studies, it is shown that, there is declines in pulmonary function test due to cigarette consumption. In this study we aimed to investigate the relationship between respiratory function test, cigarette consumption (packet-year) and gender among smokers with no respiratory symptoms.

Method: Total of 197 files of patients who admit to smoking cessation clinic were evaluated between March 2011-January 2012. 86 cases who have no respiratory complaints were enrolled in this study. Statistical analysis were done by using SPSS 15.0 statistical program. The mean cigarette consumption and pulmonary function test values [FVC(L), FEV₁(L/L.sn), FEV₁/FVC%, PEF (L/sn), MEF₂₅₋₇₅] of male and female sex were compared.

Results: 22 patients (25.6%) were female, 64 patients (74.4%) were male. Mean age of female was 38.5±9.7, male was 38.3±11.4. The mean cigarette consumption; 26±17 packet-year for men, 19±16 packet-year for female. There was no statistical difference between female and male according to cigarette consumption and age ($P>0.05$). The mean values of respiratory function test of male patients were; FVC=4702 ml(102%), FEV₁=3650 mL/1.sn (95%), FEV₁/FVC% =77, PEF=8508 mL/sn(93%), MEF₂₅₋₇₅=3330 (74%). The mean values of respiratory function test of female patients were; FVC=3286 mL(103%), FEV₁=2607 mL/1.sn (94%), FEV₁/FVC%=79, PEF=6175 mL/sn (93%), MEF₂₅₋₇₅=2650 (69%). The relationship between pulmonary function test values and gender was not statistically meaningful ($p>0.05$). Among female, the mean % values of MEF₂₅₋₇₅ were lower than the normal range that shows effected small airways.

Conclusion: Damage to small airways due to smoking begins earlier periods among women.

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Health-related effects of smoking on patients with bronchial asthma participating in a disease management program. Results from the DMP asthma in the north Rhine Region, Germany

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Background and objective: Asthma is one of the most common chronic disorders. In Germany in 2006 a disease management program (DMP) for asthma started, focussing on patient education, standardised documentation and optimisation of quality of care. Smoking is known as a negative risk factor on pathogenesis for asthma. We want to check whether there is also an effect of smoking on selected outcome parameters.

Methods and population: In 2010 there were 85.586 patients and 4.166 physicians, who participated. We conducted descriptive cross-sectional analyses and a logistic regression for all DMP participants. We used standardised medical records providing information on pharmacotherapy, frequency of symptoms and non-medical interventions. A three-step severity scale has been developed, which is based on different parameters (e.g. Peak Flow Value).

Results: Smokers have a three times lower chance to avoid asthma-related emergency department visits (OR 0.32; CI 95%: 0.11 – 0.92). Further they suffer more often from daily symptoms (17 vs. 12%) and show less current absence of asthma symptoms (31 vs. 25%). The severity scale show that smokers suffer more often from more severe asthma (Group 1 15%, Group 2 18%, Group 3: 24%). Hence smokers get more often controller medication than non-smokers (67 vs. 64%).

Conclusions: There were worse results for smokers relating health-related parameters, e.g. they suffer more often on asthma symptoms. Therefore efforts on smoke prevention for asthma patients need further improvement. Limitations due to potential selection bias in the DMP population have to be considered.

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Intervention study to evaluate effectiveness of integrated therapy (varenicline plus motivational interviewing) for smoking cessation in diabetic patients
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Background: The prevalence of smoking among people with diabetes is similar to that in the general population. For smokers with diabetes, however, the complications incurred are not equal.

All-cause mortality is increased in smokers with diabetes, and the risk of macro and microvascular complications is also increased (1).

Aim and objectives: We designed a study to monitor possible modifications in the smoking habits of 40 regular diabetic smokers experimenting and Integrated Therapy (Varenicline plus Motivational Interviewing) focusing on smoking reduction and smoking abstinence.

Methods: Study participants were invited to attend a total of five study visits: at baseline, week-4, week-8, week-12 and week-24. Number of cigarettes smoked, and exhaled carbon monoxide levels were measured at each visit. Smoking reduction and abstinence rates were calculated. Adverse events were also reviewed.

Results: Sustained 50% reduction in the number of cig/day at week-24 was shown in 45% participants. Sustained smoking abstinence at week-24 was observed in 40% of participants.

Conclusion: The use of Integrated Therapy (Varenicline plus Motivational Interviewing) improve smoking cessation and reduction in diabetic smokers intending to quit.

1. Solberg L, Desai J, O'Connor P, Bishop D, Devlin H: Diabetic patients who smoke: are they different? *Ann Fam Med* 2:26-32, 2004.

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Earthquake rattled Christchurch residents reach for cigarettes
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The magnitude 7.1 Canterbury earthquake in September 2010 and associated after-shocks have caused untold damage, drastically changed residents' living, working, social conditions and taken the lives of 184 people.

Aim: To assess the impact of the Christchurch earthquakes on changes in smoking status and tobacco consumption of current smokers.

Methods: Semi-structured interviews in public locations with high pedestrian flow, including two city malls and the central bus exchange. The interviews were carried out 15 months after the first major earthquake. A total of 1001 people were interviewed.

Results: At the August 2010 point (prior to any earthquakes) 589 (58.9%) had smoked cigarettes or tobacco at some point in their lives; 400 (40.9%) never smoked and three participants (0.3%) were not sure. Of the 319 people who were not smoking in August 2010, 76 (23.8%) had smoked at least one cigarette since the September earthquake, 29 (38.2%) of whom had smoked more than 100 cigarettes. Of the 273 participants smoking in August 2010, 86 (31.5%) had since decreased consumption, 94 (34.4%) had not changed, deletion and 93 (34.1%) had increased consumption. Of the 86 people who decreased, six (7.0%) attributed the earthquake and subsequent lifestyle as a reason to reduce smoking. Of the 93 people who increased, 53 (57.0%) attributed the earthquake and subsequent lifestyle changes as a reason to increase smoking.

Conclusion: The prevalence of smoking in Christchurch has increased in the 15 months following the first major quake in Sept 2010. 28% of people not smoking prior to the earthquakes smoked one or more cigarettes and people smoking prior to the earthquakes increased their consumption.

471. Environment and public health: chemicals, moulds and volcanos

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Eyjafjallajökull 2010: Respiratory morbidity and symptoms following exposure to a volcanic eruption
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Background: The eruption of Eyjafjallajökull, Iceland 2010 posed an opportunity to study health effects of a volcanic eruption in a society with strong infrastructure.

The aim of the study was to evaluate the health of the exposed population compared to control population.

Methods: Six months after the eruption, (fall and winter 2010-11), 1148 exposed South Icelanders and 510 unexposed North Icelanders responded to a questionnaire on recent physical symptoms and questions from the European Community Respiratory Health questionnaire. The data was analyzed using logistic regression adjusted for age, gender, education and smoking status.

Results: Demographic characteristics and underlying disease rates were similar in the two groups. The exposed group reported more symptoms during the last 12 months; morning phlegm in winter, OR 1.5 (95%CI 1.3-1.8) and runny or stuffed nose, OR 1.4 (95%CI 1.2-1.6). Recent (last month) symptoms were more increased, for example cough, OR 2.6 (95%CI 1.7-3.8) and phlegm, OR 2.1 (95%CI 1.3-3.2), eye irritation, OR 2.9 (95%CI 1.8-4.5) and runny or irritated nose, OR 2.0 (95%CI 1.4-2.9). Respiratory symptoms were more prevalent among those living closest to the volcano. Upper airway symptoms coexisted, so those who reported one symptom were likely to have others also.

Discussion: Six months after the Eyjafjallajökull eruption our results indicate that the presence of volcanic ash is associated with two to three times higher recent upper airway symptom rates among the exposed population compared to the unexposed.

Conclusion: Exposure to volcanic ash may increase respiratory morbidity symptoms six months post eruption, but long-term consequences are still unknown.

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Outdoor exposure to formaldehyde is associated with increased DNA damage and respiratory symptoms in children

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Background: Exposure to air pollutants emitted by industrial sources may be a health hazard for children living nearby.

Objectives: To evaluate whether residential outdoor exposure to formaldehyde was associated with DNA damage and with respiratory symptoms in children who lived in the largest chipboard manufacturing area in Northern Italy (Viadana).

Methods: In 2010, randomly selected children (6-12 years) living in the Viadana district were surveyed through a parental questionnaire on respiratory symptoms. A score was devised to evaluate the presence/intensity of asthma-like symptoms. DNA strand breaks and nuclear abnormalities of the oral mucosa cells were analyzed by the comet and micronucleus assays respectively. Passive samplers (n=63) were installed in the area to monitor formaldehyde both in winter and summer 2010. Kriging interpolation was used to estimate the concentration of formaldehyde of each child. Appropriate regression models were fitted to the data.

Results: 417 out of 656 eligible children (64%) took part in the study. Children living near (<2km) the chipboard factories had the highest (p<0.001) formaldehyde exposure. A 1-standard deviation increase in formaldehyde (+0.16 µg/m³) was associated with an increase of 10% (95%CI: 5-20%) in the comet tail intensity and of 10% (95%CI: 1-19%) in the frequency of nuclear buds. Children exposed to the highest level of formaldehyde (>85th centile) had an increased risk of asthma like symptoms (OR=2.1; 1.1-4.2).

Conclusions: Exposure to pollutants emitted by chipboard industries statistically significantly increased DNA damage and asthma-like symptoms in children.

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Confirmed moisture damage and risk of asthma from birth to age 6 years

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Introduction: Few cohort studies are available on the association between moisture damage, confirmed by technical inspection, and risk of new asthma.

Aim: To study the association between confirmed moisture damage at the age of 5 months on average and risk of asthma by the age of 6 years.

Methods: Building inspection was performed by building engineers in the homes of 394 children, and the children were followed up with repeated questionnaires from birth to the age of 6 years. Current asthma was defined as doctor diagnoses of asthma ever and either current asthma medication or wheezing symptoms at the age of 6 years. Odds ratios (OR) were adjusted for potential confounders using discrete time hazard model and GEE.

Results: Severe moisture damage in the kitchen (OR 2.80, 95%CI 1.02-7.64) or in the child's bedroom (OR 3.65, 95%CI 1.00-13.28) and visible mold in the child's bedroom (OR 4.02, 95%CI 1.58-10.21) increased the incidence of doctor diagnosed asthma ever in life (n=60). Similar associations were observed with current asthma (n=33) and with wheezing apart from cold. Weaker associations were observed with moisture damage in the main living areas. No consistent associations were observed with moisture damage in the bathrooms or in other interior spaces of the house. There was some suggestion that the associations were weaker during the latter part of the follow-up.

Conclusions: The results are consistent with our earlier report over the first 1.5 years of life (Karvonen et al. 2009). The results support earlier conclusions that moisture damage not only increases the risk of respiratory symptoms, but is also associated with increased risk of developing new asthma.

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Home dampness and mould, $\beta(1,3)$ -D-glucan in mattress dust and respiratory symptoms in adults from 10 European countries

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β -glucans are pro-inflammatory fungal cell wall components that have been associated with adverse respiratory health effects in children. We measured $\beta(1,3)$ -D-glucans in mattress dust samples from 973 randomly selected adults from 22 ECRHS study centres in 10 European countries using an enzyme immunoassay. Information on respiratory symptoms, housing characteristics, dampness and mould was obtained by face-to-face interviews and home visits following a common protocol. Study centre explained 28% of the total variance in glucan concentration with geometric means ranging from 0.40 $\mu\text{g}/\text{mg}$ in Reykjavik, Iceland, to 1.77 $\mu\text{g}/\text{mg}$ in Barcelona, Spain. Damp or mould problems in the previous year were reported by 30% of the participants (range 11-50% across centres) and was significantly associated with a 10% higher glucan level when controlling for centre. Mattresses older than 5 years contained on average 20% more glucan than mattresses less than one year old. The presence of a cat or a dog in the home increased 17-24% the glucan concentration. Nasal symptoms in the previous year (overall 38%) were more prevalent when damp or mould was reported (adjusted Odds Ratio (OR) 1.35; 95%CI 1.00-1.82). However, nasal symptoms were not associated with glucan level (OR 1.00 without indications for heterogeneity across centres). Similarly there was no association of asthma symptom score with mattress glucan level. In conclusion, $\beta(1,3)$ -D-glucans are ubiquitous in mattress dust from European homes. Although weakly associated with damp and mould problems there was no evidence that mattress levels of $\beta(1,3)$ -D-glucans were associated with respiratory health in adults.

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Exhaled nitrogen oxide (FeNO) and nasal patency in adults in relation to levels of airborne fungal DNA in dwellings in Lund, Sweden

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Background: Questionnaire studies have reported associations between indoor moulds and dampness, asthma and rhinitis. We investigated if levels of fungal DNA in dwellings were associated with nasal patency, tear film stability, and levels of exhaled NO.

Methods: Totally 49 adults from 42 homes, randomly selected from a larger population survey in the city of Lund, Scania, Sweden. Exhaled NO was measured by NIOX MINO (50 ml/min). Nasal patency was measured by acoustic rhinometry. Tear film break up time (BUT) was monitored as a sign of eye irritation. FeNO was log-transformed and associations were analysed by multiple linear regression, adjusting for age, gender, pollen/furry pet allergy and smoking. Fungal DNA in airborne settled dust was measured in the living room for one week by Petri dish method and levels of five fungal DNA-sequences were analysed by QPCR.

Results: Three types of fungal DNA was commonly found in the homes. Exhaled NO was higher at higher concentrations of total fungal DNA ($p=0.04$). Mean cross-sectional area in the front part of the nasal cavity was decreased at higher levels of *Aspergillus/Penicillium* DNA ($p=0.05$), and posterior cross-sectional area was decreased at higher levels of *Aspergillus versicolor* DNA ($p=0.05$). No associations were found between BUT and fungal DNA.

Conclusion: Fungal DNA in settled dust in random selected ordinary homes can be a risk factor for nasal inflammation, measured as decreased nasal patency, and lower airway inflammation measured as exhaled NO.

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Lung function decline in elderly in relation to phthalate metabolites and bisphenol A levels in serum: A 5-year prospective study

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Background: Some recent studies report associations between phthalate exposure and asthma in pre-school children. We investigated if circulating levels of phthalates and bisphenol A (BPA) predicts lung function decline in an elderly population.

Methods: PIVUS is a cohort, based on a population sample of subjects, aged 70 years in Uppsala, Sweden. Circulating levels of BPA and phthalate metabolites in serum was measured at baseline by LC-MS/MS. Lung function was measured at baseline and after 5 years in 668 subjects. Change of forced expiratory volume in 1 s (FEV₁) was calculated. Associations were analysed by multivariate modelling adjusting for height, smoking at 70 and 75 y, pack years of tobacco at 70 y, education level, exercise habits and gender, using ln transformed values for circulating levels, excluding 36 subjects with asthma or COPD at baseline

Results: BPA median level was 3.75 ng/mL, Monethyl hexyl phthalate (MEHP) 4.51 ng/mL, monethyl phthalate (MEP) 11.6 ng/mL, Monoisobutyl phthalate (MiBP) 13.5 ng/mL, and Monomethyl phthalate (MEHP) 1.51 ng/mL, with no gender differences. The annual decline in FEV₁ was -55.6 ml/year. MEHP was associated with an additional decline in FEV₁ of -6.0 ml/year (95% CI -8.6 to -3.4) ($p<0.001$), while MMP was associated with an additional improvement in FEV₁ of 6.6 ml/year (95% CI 3.2 to 9.8) ($p<0.001$). The association for MEHP was significant in both men and women, while the association for MMP was significant in women, only.

Discussion: Associations between circulating levels of some phthalates metabolites and the five year decline of FEV₁ were found, with MEHP as a risk factor for lung function decline.

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Measuring concern about pollution in questionnaire-based environmental surveys

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Understanding attitudes towards pollution in the population might help to prevent bias in questionnaire-based environmental studies, because subjects living closer to emission sources may be more concerned than those who live farther away, thus tending to over-report adverse health outcomes.

Using data from a survey on parents of 3697 school-age children (response rate 99%) in an industrial area in northern Italy (Viadana), we devised a score on environmental concerns (EC), evaluated its psychometric properties and its association with several determinants.

Six questions surveyed respondents' concerns about electromagnetic fields (EMFs),

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traffic, lack of public parks, air pollution, indoor cigarette smoke and chemicals in food. Answers were coded as 0 (don't know/not at all), 1 (a little), 2 (quite a lot), 3 (a lot). Explanatory factor analysis (EFA) and homogeneity analysis were performed. A summed score was computed (range 0-18). The association between a 1-unit increase in the score and potential determinants was estimated by relative risks (RRs), obtained by negative binomial regression.

EFA identified one unique factor, explaining 61% of the variance. The homogeneity analysis revealed its good internal reliability (Cronbach's $\alpha = 0.85$) and confirmed the equidistance of the item options response. Item mean scores ranged from 2.0 ± 1.0 (EMFs) to 2.8 ± 0.7 (air pollution). Fathers, indoor-smokers, low educated and non-Italian parents reported less concerns (RRs=0.59, 0.68, 0.38, and 0.82, respectively) with respect to referral groups ($p < 0.001$).

Respondents' characteristics influence their level of EC. The devised score may be useful in future research to control for EC-related confounding.