Inhalation of gaseous superoxide (GS) as adaptive oxidative training for asthma patients


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There is a direct correlation between the increased reactivity of the bronchial muscles and the endogenous oxidative stress (OS) suffered by the asthmatic. Two independent studies have been conducted into the influence of short-term intermittent GS inhalation on the reduction of OS and the improvement in the clinical picture of atopic asthmatics from different age groups. A total of 78 patients took part in the trials: 27 aged mean = 42 (Group A) and 51 aged mean = 12 (placebo-controlled double-blind trial in the case of Group B). In both groups there was a stable improvement in the spirometric parameters and clinical course in ca. 85% of cases. In Group A, a reduction of the initially high activity of superoxide dismutase and glutathione peroxidase (p < 0.001) was observed, as well as an increase in activity of glutathione reductase in the erythrocytes (p < 0.001) and an improvement in all major spirometric findings, including the results of the methacholine and salbutamol test. In Group B, a negative correlation between the initial values and the amount by which they changed was determined for PEF (r = 0.72; p < 0.0001), FEV1 (r = 0.52, p = 0.006), and PEF25% (r = 0.72, p = 0.001), as well as highly significant improvements in the scores with regard to subjective statements on frequency and severity of attacks, of coughing, and amount of sputum. The positive clinical findings arising out of this adjuvant therapy are being interpreted as the result of an adaptive course of training for asthma patients.

Erdosteine and its metabolites as antioxidants in the FeCl^-induced rats paw oedema

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Completely suppressed by concentrations of 1 mM Theo (94 ± 8%; n = 5) and 3 Zardaverinc (Zard; type 3/4) in addition to Theo and IBMX on allergen responses of human airways.

We conclude that erdosteine, inactive in vitro, shows in the in vivo oedema test results of the methacholine and salbutamol test. In Group B, a negative correlation between the initial values and the amount by which they changed was determined for PEF (r = 0.72; p < 0.0001), FEV1 (r = 0.52, p = 0.006), and PEF25% (r = 0.72, p = 0.001), as well as highly significant improvements in the scores with regard to subjective statements on frequency and severity of attacks, of coughing, and amount of sputum. The positive clinical findings arising out of this adjuvant therapy are being interpreted as the result of an adaptive course of training for asthma patients.

Effect of selective and non-selective phosphodiesterase inhibitors on allergen-induced contractions in passively sensitized human airways


The non-selective phosphodiesterase (PDE) inhibitors theophylline (Theo) and 3-isobutyl-1-methylxanthine (IBMX) block allergen-induced contraction of human airways in vitro by a dual mechanism involving a direct relaxant effect on smooth muscle and inhibition of cysteinyl leukotriene release from airways (Morton, B.E. et al. Am J Respir Crit Care Med 1995; 151: A388). To further determine the involvement of PDE isoenzymes we investigated the effect of the methylxanthines and the specific PDE inhibitors motnopamine (Mota; type 3), RPF73401 (RPF; type 4) and zardaverinc (Zard; type 3/4) in addition to Theo and IBMX on allergen responses of human airways in vitro. Airways from 33 patients were sensitized overnight with a methacholine concentration (IC50) of 100 μM. The PDE inhibitors were used at different concentrations (1 μM - 1 mM). The percentage of contraction in response to the allergen was determined. All results were compared to untreated controls. The best results were achieved with Theo and Zard, while Mota was less effective. The PDE inhibitors were able to inhibit the contraction induced by the allergen in a dosedependent manner. The most effective inhibitor was Theo, followed by IBMX and Zard, while Mota was the least effective. The results suggest a role for PDE isoenzymes in the regulation of allergen-induced contraction of human airways.

Surveys of selected occupational groups

2050 Health based selection for asthma, and not for chronic bronchitis, in pig farmers: A hypothesis

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To study the mechanisms of respiratory disease in swine confinement farming, a questionnaire study was performed among 239 pig farmers and 311 non-exposed controls. Pig farmers are exposed to a number of factors promoting the development of both chronic obstructive pulmonary disease and asthma. Still, in most prevalence studies, only an elevated prevalence of chronic bronchitis, and not one of asthma, is reported.

The prevalence of chronic bronchitis (phlegm on most days for 3 months during the last 2 years) was significantly higher in pig farmers than in controls (15.5 vs. 3.9%, p < 0.001), whereas self-reported asthma was not (5.9 vs. 5.5%, p = 0.84). However, childhood atopy, defined by questions on hay fever, asthma, atopic bronchitis or eczema in childhood, was significantly less prevalent in pig farmers, than in controls (9.9 vs. 17.2%, p < 0.05). As expected, childhood atopy was significantly associated with self-reported asthma (prevalence odds ratio 10.5, 95% confidence interval 4.8–22.9, adjusted for age and pack years of smoking).

Therefore, a lower prevalence of asthma among pig farmers would be expected. It is probable that people suffering from signs of asthma at an early age avoid a career in confinement farming. This leaves a selected group of farmers, less susceptible to a development of asthma than the population at large. The factors in confinement farming promoting development of asthma subsequently lead to a prevalence of asthma just as high as in controls. This selection mechanism probably does not apply for the gradually developing symptoms of cough and phlegm in chronic bronchitis.

In conclusion we hypothesize a health based selection of profession for asthma, and not for chronic bronchitis, in pig farmers, obscuring associations between occupation and asthma.

2051 Respiratory symptom and lung function changes occurring within 24 hours of re-exposure in British pig farm workers

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Aims: To test the hypothesis that delayed reductions in expiratory flow rates would occur in pig farm workers (also exposed to endotoxin).

Methods: FEV1 and PEFR were recorded by spirometer in 28 pig farm workers after a weekend off work just before and at approximately 5, 10 and 24 hours after start of re-exposure (the Monday shift — 07.00 to 17.00). Each worker retrospectively applied scoring respiratory symptoms on a scale (0–10) for the 24 hour period before and after re-exposure.

Results: There was a progressive decline in both FEV1 (Fig. 1) and PEFR from start of re-exposure (mean decrements 0.020, 0.043, 0.119 litres and 1.26, 7.86 and 17.70 litres/min respectively). The only statistically significant difference from pre-exposure values occurred 24 hours later for PEV1 (p = 0.0003) and PEFR (p = 0.02) representing 3.0% and 3.5% reductions respectively (paired t-test).

No significant differences were seen between symptom scores before and after re-exposure for any respiratory symptom (Wilcoxon test). Discussion: Overall these findings are not clinically significant. However the small reductions of 3.0% in FEV1 and 3.5% in PEFR after 24 hours of re-exposure may be significant and not due to diurnal variation. These changes may represent delayed airways inflammation from re-exposure to endotoxin and contribute to the pathogenesis of chronic airways limitation that has recently been shown in longitudinal studies of pig farm workers (Reynolds SJ et al, Am J Ind Med 1996; 29:3–40).