Abstract

Background: Clinical observations point to an expanding group of individuals attributing hypersensitivity phenomena to indoor air pollution. Objective: It was the aim of this study to characterize such subjects by an approach of interdisciplinary investigations. Methods: 65 individuals, recruited by a public campaign, were investigated by a thorough allergological examination and a structured psychological interview. Measurements of common indoor pollutants in the air and in the dust were performed in rooms of several selected patients. Results: 42 patients (65%) revealed a sensitization to common allergens, out of these 32 (49%) to house dust mites. 38 (58%) patients showed a psychosomatic or psychotic disorder. Increased concentrations of at least one of the measured substances were found in 11 out of 13 patients. According to these results, four groups of patients could be identified: 17 patients (26%) had "classic" allergic diseases treated inadequately. In 19 patients (29%) allergic diseases were superimposed by strong psychosomatic interactions. An exclusive psychosomatic or psychotic cause of the complaints was found in 19 (29%). 10 subjects (16%) had "classic" allergic diseases (e.g. allergic rhinoconjunctivitis, urticaria), however, there were additional indications of hypersensitivity reactions to components other than classical allergens. Conclusion: Patients presenting with hypersensitivity phenomena attributed by themselves to indoor air pollution are a heterogeneous group and need a diligent work-up including intense allergological examination. The role of increased concentrations of indoor air pollutants has to be elucidated further.

Introduction

In recent years, air pollution as well as allergy have raised much interest in the general public, and there are increasing numbers of patients attributing hypersensitivity phenomena to indoor air exposures. There are a number of disorders that are associated with indoor pollutants. The sick building syndrome is characterized by symptoms of mucous membrane irritation, neurotoxic effects, asthma and asthma-like symptoms, skin dryness and irritation, gastrointestinal complaints and other ailments associated with certain modern buildings [1]. The multiple chemical sensitivity (MCS) syndrome is a complex, chronic disorder with multisystemic symptoms occurring in response to a wide variety of chemical
odours or low-level exposures [2]. The term „clinical ecology syndrome“ („eco-syndrome“) was suggested for a group of patients suffering from polysomatic complaints with a subjective feeling of allergy against environmental noxious agents [3].

It has been shown that asthma and rhinitis can be exacerbated by respiratory irritants [4, 5]. In a random general telephone survey the prevalence of sensitivity to chemical irritants was equivalent to that of allergy [6]. 6.3% of respondents to a population-based survey reported a doctor’s diagnosis of environmental illness or MCS and 15.9% allergies or unusual sensitivity to everyday chemicals [7]. While allergic diseases can be verified by skin tests, in vitro tests and challenge tests, at this time there are no methods to demonstrate sensitivity to environmental chemicals in an objective manner. As people spend most of their time indoors at work or at home, a real and frequent occurrence of hypersensitivity to chemical indoor pollution would be of major concern. We conducted a study, in which individuals complaining of hypersensitivity to indoor pollution were evaluated by a thorough allergological and psychological investigation. Furthermore, measurements of common indoor air pollutants were performed in rooms of some of these patients.

Materials and Methods

Study Group

By a public campaign (newspaper, information by telephone call), a study dealing with hypersensitivity due to indoor pollution was announced and individuals with respective complaints were invited to participate (24 males, 45 females, mean age 45.8±15.0 years).

Questionnaire

All individuals answered a specific questionnaire regarding their symptoms and their medical history, including family and personal history of allergies, as well as their living and work places with special regard to building materials, heating, conditions of walls and floors, temperature, air humidity, interior equipment and habits (Table 1).

Allergy Diagnosis

Skin prick tests (also dermal tests, if skin prick tests were negative) with a broad spectrum of aeroallergens and food allergens (Bencard, SmithKline Beecham GmbH, Neuss, Germany) and the determination of specific IgE antibodies in the serum (Pharmacia CAP System, RAST FEIA; Pharmacia, Uppsala, Sweden) to a panel of potential indoor allergens were performed. If needed, these investigations were supplemented by nasal challenge tests. Special care was taken to assess the relationship between hypersensitivity and their possible elicitors.