

## Personality characteristics in chronic and non-chronic allergic conditions

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### Abstract

In psycho-allergological research, the potential relevance of personality factors in the maintenance and exacerbation of atopic symptoms is still a matter of debate. The present study aimed to assess personality dimensions in *chronic* atopic disease, i.e. atopic dermatitis (AD) and in *acute* manifestation of atopy (seasonal allergic rhinitis, SAR). Further, the association of a potentially atopy-specific personality profile with atopy-relevant biological stress responses should be evaluated. Subjects suffering from AD ( $n = 36$ ), or SAR ( $n = 20$ ) and non-atopic controls ( $n = 37$ ) were investigated. To determine different personality domains, Spielberger's State-Trait Anxiety Inventory (STAI), the Questionnaire for Competence and Control (FKK) and the Questionnaire for Stress Vulnerability (MESA) were administered. To assess the relation between these personality dimensions and biological stress responses, atopics and non-atopic controls were exposed to a standardized laboratory stressor (Trier Social Stress Test, TSST). Endocrine (cortisol, ACTH), immune (total IgE, leukocyte subsets) and physiological (heart rates) measures were recorded before and after the stress test. When compared to healthy controls, AD and SAR patients showed significantly higher trait anxiety (STAI) and stress vulnerability in situations characterized by failure, job overload and social conflicts (MESA). Moreover, AD subjects scored significantly lower in self-competence and self-efficacy (FKK) as well as in recreation ability (MESA). No difference trait anxiety and stress vulnerability could be detected between AD and SAR subjects. Pearson correlational analyses yielded no significant correlation between the different personality domains and the endocrine, physiological and immunological stress responses. However, stress-induced increase in eosinophil number was significantly correlated with the perceived self-competence/self-efficacy in SAR patients.

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### 1. Introduction

Atopic dermatitis (AD) is a chronic, inflammatory skin disease with main symptoms such as eczematous skin, erythematous papules and severe pruritus (Boguniewicz, 2004; Leung et al., 2004). In the last 30 years, the frequency of AD has significantly increased, with a current estimated prevalence of 15–24% in the industrialized countries. Now-

adays, AD represents one of the most frequent chronic diseases and accounts for up to 20% of all patients treated in dermatology departments. (Van Moerbeke, 1997; Mortz et al., 2001). Although AD is not a life-threatening disease, AD symptomatology results in significant morbidity often associated with hospitalization, school absenteeism and missing work days. The unpredictability of the disease, the torturing pruritus and the feeling to be cosmetically disfigured further imposes a psychological burden on AD sufferers and their relatives.

It is broadly accepted that numerous factors such as genetic disposition, climate, allergens or microbial organ-

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isms (*Staphylococcus aureus*) are involved in AD (Sturgill and Bernard, 2004; Abramovits, 2005). However, research of the last decade strongly suggests the importance of a complex dysregulation of the immune system in the pathology of AD. In AD patients, exposure to environmental allergens leads to B cell activation and hypersecretion of allergen-specific immunoglobulin-E (IgE) initiating acute hypersensitivity reaction of the skin. Additionally, activation of TH<sub>2</sub> cells with a predominant secretion of TH<sub>2</sub> cytokines (interleukin-4, interleukin-5, interleukin-10) has been reported. A shift towards a TH<sub>2</sub>-dominated cytokine profile, however, has been found to be responsible for immunoregulatory abnormalities such as an immunoglobulin-switch from other Ig isotypes to IgE or eosinophil recruitment and infiltration into sites of allergic tissue inflammation (Boguniewicz, 2004; Allam et al., 2005).

Besides abnormal immune responses, psychological factors such as stress or personality have been assumed to play a pivotal role in AD pathogenesis (Buske-Kirschbaum, 2007). The existence of a close relationship between psychological factors and the skin has long been noticed and discussed. In the 1940s, Alexander and French (1948) leading an influential school of psychosomatic thought postulated that the AD child is characterized by a distinct emotional conflict which was felt to revolve around the child's failure to express anger and hostility stemming from maternal rejection. Although some studies have explored this hypothesis suggesting elevated anxiety, hopelessness and overprotection as well as maternal rejection is more frequent in families with AD children, the maternal rejection/suppressed anger and hostility hypothesis could not be conclusively supported (Ring and Palos, 1986; Pauli-Pott et al., 1999). However, the general idea was followed by numerous investigators attempting to identify a specific conflict or distinct personality profile which characterizes the AD patient, and may make an individual more vulnerable to developing AD. In this line of research it has been suggested that AD sufferers display an atopy-specific personality pattern characterized by increased neuroticism, hostility, anxiety, hypersensitivity, aggressiveness, feelings of inferiority, tension, depression, restlessness, insecurity, lability and rigidity (Greenhill and Finesinger, 1942; Rogerson, 1947; Kepecs et al., 1951). More recent data show that atopics are more intelligent, timid, suspicious, anxious, depressive, emotionally less stable and show higher interests in power and social influence with concurrent lower need for affiliation and achievement (White et al., 1990; Arima et al., 2005; Bahmer et al., 2007).

It should be emphasized, however, that the approach to link a distinct personality profile to AD has been criticized and is still a matter of debate. The available data are quite heterogeneous, and there are reports which failed to show any relationship between personality and AD (Gieler et al., 1985). It has further been argued that the personality pattern described in AD patients

may not reflect an atopy-specific personality profile but rather a personality structure of the 'chronically ill' which would question the etiological significance of the proposed AD personality pattern (White et al., 1990). Moreover, it is not clear whether the personality structure described in AD patients represents a premorbid personality profile that may be of etiological significance, or whether, due to the debilitating effects of a chronic skin disease, AD sufferers may exhibit 'reactive' personality structures (which in turn may have an impact on the disease course). Finally, it has been criticized that most of the studies did not address the question what the underlying (psychobiological) mechanisms of a relationship between distinct personality characteristics and AD might be.

The specific goal of the present study was thus to evaluate whether AD patients exhibit a distinct personality profile that is atopy-specific, and can also be distinguished from other forms of atopy such as seasonal allergic rhinitis (SAR). SAR is a highly common atopic disorder affecting between 9% and 24% of adults, and up to 42% children in the industrialized countries (Nathan et al., 1997). The main symptoms of SAR are rhinorrhea, sneezing, pruritus and congestion. Immunopathology of SAR resembles the pathology described in AD and allergic asthma (AA) in that IgE hypersecretion in response to allergen exposure, mast cell degranulation and release of vasoactive mediators, activation of mainly TH<sub>2</sub> cells with a release of a predominant TH<sub>2</sub>-specific cytokine profile and eosinophil activation and infiltration can be found (Wilson et al., 1994; Nouri-Aria et al., 2000; Borish, 2003). However, in contrast to AD which is considered to be *chronic* manifestation of atopy, SAR is an *acute*, intermittent atopic disorder closely linked to the exposure of mostly seasonal occurring allergens such as dander or pollen (Salib et al., 2003). Thus, the existence of two atopic disease forms that share key aspects of immunopathogenesis but can manifest in a chronic (AD) or an acute/intermittent (SAR) form may represent a unique model to study the effect of acuity/chronicity of a given disease on personality characteristics.

Additionally, the study addresses the question whether possible atopy-specific personality traits are linked to endocrine and immunological stress responses in AD and SAR patients. This idea evolved from recent findings of our laboratory showing significantly altered cortisol and/or catecholamine responses in AD and SAR patients when confronted with psychosocial stress. (Buske-Kirschbaum et al., in preparation). In addition, stress-induced changes of immune functions known to be pathologically relevant were altered in AD sufferers (Buske-Kirschbaum et al., 2002a). Based on these observations we presumed that an atopy-specific personality structure in AD and SAR patients may be linked to an altered biological stress response that may render the person more vulnerable to develop and exacerbate atopic symptomatology especially under stressful conditions.

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