Comparison of Personality Traits among Patients with Psoriasis, Atopic Dermatitis, and Stress: A Pilot Study

Lynda Grine\textsuperscript{a} Giulia Tochtermann\textsuperscript{b} Hilde Lapeere\textsuperscript{a} Nele Maes\textsuperscript{a} Günther F.L. Hofbauer\textsuperscript{b} Myriam Vervaet\textsuperscript{c} Jo Lambert\textsuperscript{a}

\textsuperscript{a}Department of Dermatology, Ghent University Hospital, Ghent, Belgium; \textsuperscript{b}Department of Dermatology, University Hospital, University of Zurich, Zurich, Switzerland; \textsuperscript{c}Department of Psychiatry, Ghent University Hospital, Ghent, Belgium

Keywords
Educational program · Patient education · Stress · Psoriasis · Atopic dermatitis

Abstract
\textbf{Background:} Psoriasis and atopic dermatitis are chronic skin diseases that greatly affect the quality of life. Both diseases can be triggered or exacerbated by stress. \textbf{Objective:} We aimed to differentiate personality traits between patients with chronic skin conditions and people treated for stress in a pilot study. \textbf{Methods:} Patients participating voluntarily in educational programs in Belgium and Switzerland were recruited to complete personality trait questionnaires, including the Temperament and Character Inventory (TCI) and the Tridimensional Personality Questionnaire (TPQ). A comparison was made with patients treated for work-related stress. \textbf{Results:} A total of 48 and 91 patients suffering from skin diseases and work-related stress, respectively, were included in the study. Based on the questionnaires, we found that dermatology patients were less persistent and impulsive than those with work-related stress. Dermatology patients also exhibited more rigidity and less focus on performance. Finally, patients with work-related stress seem more likely to change in response to health-promoting programs than patients with chronic dermatoses. \textbf{Conclusion:} Patients with chronic skin diseases may perceive and cope with stress differently in comparison to patients with work-related stress due to inherent personality traits. Therefore, stress coping mechanisms may differ among different diseases. More research is needed into the design of educational interventions and the impact of personality traits in disease-specific groups.

© 2020 S. Karger AG, Basel

Introduction

Stress is reported to be an important trigger and exacerbating factor for psoriasis (Pso) and atopic dermatitis (AD) [1], rendering both chronic skin diseases psychophysiological disorders. Presumably, Pso and AD patients experience and cope with stress differently than healthy people [2] and may benefit from psychological intervention to help with reinterpreting events and develop new coping strategies to stressful events [3]. Psychological interventions have also been suggested to tackle recurring self-management issues such as treatment adherence, yet adapted to the patient’s personality traits [4]. The latter has been studied in Pso and AD through the Temperament and Character Inventory (TCI) (Table 1) [5, 6]. Both
studies suggest that the personality dimensions in PsO and AD patients are associated with depressive symptoms, characterized by increased “harm avoidance” and low “self-directedness” in comparison to healthy volunteers.

In the university hospitals of Ghent (Belgium) and Zurich (Switzerland), people with PsO and AD can attend an educational program, including sessions on skin care, sleep quality, lifestyle, and stress reduction [7–9]. In light of the stress-skin axis in these inflammatory skin diseases, it raises the question how personality traits differ among these patients, compared to people who do not suffer from any immune-mediated inflammatory disease but experience stress as well. To this end, we studied the personality traits of patients with PsO and AD who participated in the educational program and compared them to patients who participated in a program for work-related stress in a pilot study.

**Materials and Methods**

For further details, see the online supplementary material (www.karger.com/doi/10.1159/000505543; Fig. 1).

**Results**

In Ghent, 25 patients with PsO and AD were recruited and completed the TCI questionnaire, hereafter termed “dermato-group 1.” Dermato-group 2 consisted of 23 patients from Zurich. The stress group included 91 patients. Characteristics are shown in Table 2. Gender was well balanced, although males were underrepresented in the stress group. Age and disease duration were similar in both dermato-groups. Age in the stress group differed significantly from the patients with skin

---

**Table 1. Components of the temperament and character inventory**

<table>
<thead>
<tr>
<th>Temperament</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novelty seeking (NS)</td>
<td>Impulsive vs. rigid</td>
</tr>
<tr>
<td>Harm avoidance (HA)</td>
<td>Anxious vs. risk-taking</td>
</tr>
<tr>
<td>Reward dependence (RD)</td>
<td>Approval-seeking vs. aloof</td>
</tr>
<tr>
<td>Persistence (PS)</td>
<td>Overachieving vs. underachieving</td>
</tr>
</tbody>
</table>

**Character**
- Self-directedness (SD): The extent to which an individual is responsible, reliable, resourceful, goal-oriented, and self-confident
- Cooperativeness (CO): The extent to which individuals conceive themselves as integral parts of human society
- Self-transcendence (ST): The extent to which individuals conceive themselves as integral parts of the universe as a whole

**Definition of the temperament and character dimensions based on references [15] and [16].**
Disease-specific stress perception and coping in dermatologic patients: a cross-sectional study

Introduction

Stress has been found to be a major contributor to the development and exacerbation of dermatologic diseases, although this was a small difference. When asked if stress had an impact on their skin disease, 16 out of 25 (64%) and 19 out of 23 (82.61%) from dermatogroups 1 and 2, respectively, replied positively and claimed that their skin disease was affected by mental state including stress. The first dermatogroup showed low self-directedness (SD) and self-transcendence (ST), and high harm avoidance (HA) and cooperativeness (CO; Table 3). The majority scored average for novelty seeking (NS), reward dependence (RD) and persistence (PS), confirming previous observations [5, 6]. In contrast to previous reports, we found high CO and average RD. The Zurich cohort did not exhibit a tendency in neither of the 3 temperament features. While the majority of dermatogroup 1 showed a high HA, only 17% of dermatogroup 2 showed a high score and even more participants (27%) showed a low score in HA. A comparison between the personality features NS and RD showed a more coherent picture: the majority of dermatogroup 2 also showed an average score, although the amplitudes were slightly lower compared to the Ghent cohort. A total of 18% of dermatogroup 2 scored high and low NS scores, in comparison to 25 and 27% in group 1. A third of both groups scored high RD scores, whereas low scores were underrepresented in dermatogroup 2 (4 vs. 33% in group 1). Overall, the majority of dermatogroup 2 showed an average temperament in every dimension. There were, however, no significant differences in personality traits between dermatogroups 1 and 2. For the stress group, we found that the majority scored low for SD, average for RD, CO, and ST, and high for NS, HA, and PS. The stress group differed significantly in all temperament traits and 1 character trait (Table 3); especially HA and ST were found to be higher in the stress group.

Table 2. Basic characteristics of patients

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Dermato-group 1 (n = 25)</th>
<th>Dermato-group 2 (n = 23)</th>
<th>Stress group (n = 91)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male, n (%)</td>
<td>12 (48)</td>
<td>11 (48)</td>
<td>30 (33)</td>
<td>0.226</td>
</tr>
<tr>
<td>Age, years (mean ± SD)</td>
<td>38.5±12.3</td>
<td>41.5±12.6</td>
<td>45.5±9.2</td>
<td>0.008</td>
</tr>
<tr>
<td>Disease duration, years (mean ± SD)</td>
<td>18.9±11.0</td>
<td>18.1±10.6</td>
<td>NA</td>
<td>0.780</td>
</tr>
<tr>
<td>Stress impact on skin (yes), n (%)</td>
<td>16 (64)</td>
<td>19 (83)</td>
<td>NA</td>
<td>0.147</td>
</tr>
</tbody>
</table>

NA, not applicable.

Table 3. Categorized TCI scores

<table>
<thead>
<tr>
<th>Score</th>
<th>Cohort</th>
<th>NS</th>
<th>HA</th>
<th>RD</th>
<th>PS</th>
<th>SD</th>
<th>CO</th>
<th>ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low, n (%)</td>
<td>Dermato-group 1</td>
<td>7 (27)</td>
<td>5 (20)</td>
<td>8 (33)</td>
<td>5 (18)</td>
<td>14 (55)</td>
<td>7 (27)</td>
<td>12 (49)</td>
</tr>
<tr>
<td></td>
<td>Dermato-group 2</td>
<td>2 (9 )</td>
<td>6 (26)</td>
<td>1 (4 )</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Stress group</td>
<td>22 (24)</td>
<td>11 (12)</td>
<td>16 (18)</td>
<td>10 (11)</td>
<td>56 (61)</td>
<td>22 (24)</td>
<td>24 (26)</td>
</tr>
<tr>
<td>Average, n (%)</td>
<td>Dermato-group 1</td>
<td>12 (48)</td>
<td>8 (33)</td>
<td>10 (40)</td>
<td>18 (70)</td>
<td>6 (24)</td>
<td>8 (33)</td>
<td>11 (42)</td>
</tr>
<tr>
<td></td>
<td>Dermato-group 2</td>
<td>19 (83)</td>
<td>13 (57)</td>
<td>15 (65)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Stress group</td>
<td>34 (37)</td>
<td>23 (25)</td>
<td>44 (48)</td>
<td>35 (38)</td>
<td>23 (25)</td>
<td>40 (44)</td>
<td>40 (44)</td>
</tr>
<tr>
<td>High, n (%)</td>
<td>Dermato-group 1</td>
<td>6 (25)</td>
<td>12 (47)</td>
<td>7 (27)</td>
<td>3 (12)</td>
<td>5 (21)</td>
<td>10 (40)</td>
<td>2 (9 )</td>
</tr>
<tr>
<td></td>
<td>Dermato-group 2</td>
<td>2 (9)</td>
<td>4 (17)</td>
<td>7 (30)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Stress group</td>
<td>35 (39)</td>
<td>57 (63)</td>
<td>31 (34)</td>
<td>46 (51)</td>
<td>13 (14)</td>
<td>29 (32)</td>
<td>27 (30)</td>
</tr>
</tbody>
</table>

p value: 0.003*, † 0.004‡ 0.136* 0.002* 0.769 0.555 0.036*

* Significant difference between dermato-group 1 and stress group. † Significant difference between dermatogroup 2 and stress group. NS, novelty seeking; HA, harm avoidance; RD, reward dependence; PS, persistence; SD, self-directedness; CO, cooperativeness; ST, self-transcendence.
Cloninger [10] defined positive health as the sum of high ST, high CO, low HA, and high PS. The majority of patients with Pso, AD, or stress did not respond to this profile, showing low SD and high HA. As these patients are vulnerable to stress as trigger, their personality traits indicate avoidance of conflict as suggested earlier [2]. Normally, high ST predicts attitude or lifestyle change, especially in combination with high NS and high PS [10]. Yet, neither groups show high ST though both participated voluntarily in educational health programs. However, NS and PS were significantly different between patients with chronic skin diseases or those with stress. Overall, the stress group is much more persistent when faced with frustrations and acts more impulsive. These traits, combined with a higher ST, suggest that the stress group may be more likely to personality change in response to health-promoting programs than the dermatogroups.

**Limitations and Recommendations for Future Research**

Our findings cannot be generalized due to the small sample size, although the population was recruited in 2 different countries. The comparability between both dermatogroups is set by the likeness of basic patient characteristics. Enrollment of patients in Zurich and Ghent led to the inclusion of patients with similar inclusion criteria. Yet, the similarity in demographics does not explain the different outcomes. The main limitation in methodology includes the different variants of personality questionnaires. However, as the TPQ questions are also comprised in the TCI, it is unlikely that the different outcomes are traced back to the different questionnaires. A possible reason for the different outcomes may lie in the limited number of participants used in both studies. It must be noted that not all demographics could be collected, including disease severity. This, however, could explain discrepancies, too. Furthermore, we acknowledge that the support offered by country-specific healthcare may also affect the way patients are impacted by or deal with the burden of chronic skin diseases.

A deeper understanding of the patient’s psychology and stress perception is crucial to offer patients appropriate disease management. To this end, larger sample sizes are warranted, while also exploring the differences between Pso and AD as well – as suggested by Takahashi et al. [11]. In-depth exploration of these differences through qualitative research would also allow us to better understand the implications of personality traits in order to improve the design of educational programs. In addition, our observations pose the question whether we can increase effectiveness of such programs by offering personalized educational programs.

Finally, the relationship between stress and Pso and AD remains incompletely understood. Recently, a study linked post-traumatic stress disorder to an increased risk for autoimmune diseases, including vitiligo and Pso [12]. This raises the question whether we can prevent the development of skin diseases by offering timely and personalized coping strategies to patients experiencing post-traumatic stress disorders, for instance.

**Implications for Clinical Practice**

Though some similarities are observed, we report differences in personality traits, which may impact the perception of and coping with stress. As Pso and AD sufferers often report stress as a trigger, it is therefore essential that healthcare professionals be aware that these patients experience stress differently. In addition, self-management issues such as unhealthy lifestyle and inappropriate treatment adherence have been reported in patients with Pso or AD. With lower persistence and self-transcendence, it may thus be more challenging to induce change in these patients. We report that the majority is more rigid and less focused on performance in comparison to patients who experience work-related stress. Pso and AD sufferers also showed low to mild self-transcendence, indicative for decreased health-promoting behavior [13, 14]. In conclusion, we believe that in clinical practice, these patients may benefit from interventions where topics such as coping strategies are actively taught, acting specifically on their personality traits. However, further research to confirm our findings is first warranted in order to study the effect of stress-coping programs on these different patient populations.

**Key Message**

Although stress may be a common denominator in various diseases, patients suffering from psoriasis and atopic dermatitis exhibit different personality traits compared to patients suffering from work-related stress.

**Acknowledgement**

We would like to express our gratitude to the patients who participated in this trial. This study was funded with own resources.
Statement of Ethics
The study protocol has been approved by the Ethical Committees of the respective research institutes and all subjects have given their written informed consent.

Disclosure Statement
The authors declare no conflict of interest.

Funding Sources
All research has been funded by own sources; no external financial support was provided.

Author Contributions
G.T. and G.F.L.H. recruited patients and collected data in Switzerland. H.L., N.M., M.V., and J.L. recruited patients and collected data in Belgium. Data analysis was performed by L.G., G.T., and M.V. Manuscript was drafted by L.G. Conduct of research was supervised by G.F.L.H. and J.L. All authors approved the content of the manuscript.

References