

# Psoriasis Risk Factors: Role of Lifestyle Practices

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*Psoriasis is a complex, multifactorial chronic skin disease. As in other chronic disorders, various lifestyle factors have been associated with its morbidity. We have pointed to the significance of the patient's lifestyle practices as they relate to psoriasis outcome.<sup>1</sup> Several reports in the literature suggest that exogenous and endogenous factors, including emotional stress,<sup>2</sup> alcohol use,<sup>3-5</sup> smoking,<sup>6-8</sup> and obesity,<sup>9</sup> may have deleterious effects on the increased morbidity of psoriasis. In this study, we carried out a comprehensive evaluation to assess the effects of stress, alcohol use, smoking, obesity, and exercise on the natural history of psoriasis.*

## Materials and Methods

The 3 sources of data for this study were the Personal Wellness Profile questionnaire, the Psoriasis Life Histories questionnaire, and the patient's medical record.

Data from 104 patients (60 men and 44 women) were obtained from the Psoriasis Research Institute in Palo Alto, California. Each patient filled out a Personal Wellness Profile questionnaire, which provides information about a patient's lifestyle practices,<sup>1</sup> and a Psoriasis Life Histories questionnaire. Table I lists the various components of this questionnaire. The patients' responses to both questionnaires were sent to Wellsource Inc. (Clackamas, Oregon) for analysis. A personal wellness report was received for every patient. This report provides an overview of the major factors associated with good health. Sixteen wellness factors were evaluated on a scale of poor to excellent (Table I). Of these 16 factors, 5 relevant ones were assessed: stress/coping status, alcohol consumption, smoking, body weight, and exercise level.

The data from the personal wellness reports were analyzed according to the following protocol. If a

Table I.

## Wellness Factors Measured

Exercise level  
Nutrition status  
Smoking/tobacco use  
Cholesterol level  
Blood pressure  
Body weight  
Coronary risk  
Stress/coping status  
Alcohol consumption  
Seat belt usage  
Safety score  
Happiness scale  
Sleep, 7–8 h/d  
Sick days  
Cancer awareness  
Overall wellness rating

patient scored within the good-to-excellent range on the wellness column chart with respect to "stress/coping status," "alcohol consumption," "smoking/tobacco use," "body weight," and "exercise level," the data were entered as not distressed, low to no alcohol use, light to nonsmoker, lean body weight, and high exercise level, respectively (Table II). If the patient scored within the poor-to-fair/average range with respect to "stress/coping status," "alcohol consumption," "smoking/tobacco use," "body weight," and "exercise level," the data were entered as distressed, heavy alcohol use, smoker, overweight, and low exercise, respectively (Table II).

With respect to the Psoriasis Life Histories questionnaire, questions relating to age of onset, stress, remission, and severity were utilized to produce the data. The question related to stress was, "At times of worry, do new patches of psoriasis appear?" The vari-

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Table II.

**Personal Wellness Report Criteria for Stress, Alcohol Use, Smoking, Obesity, and Exercise**

Data entered as	Distressed	Heavy alcohol use	Smoker	Overweight	Low exercise level
If patient answered...	"Heavy Stress—trouble coping, often stressed but coping"	"Moderate alcohol use," "moderately high alcohol use," or "heavy alcohol use"	"Use smokeless tobacco," "<10 cigarettes per day," or "quit smoking <10 years ago"	"Over recommended" or "high, over recommended"	"No exercise program," "inadequate exercise," or "minimal exercise"
Data entered as	Not distressed	Low to no alcohol use	Light to nonsmoker	Lean body weight	High exercise level
If patient answered...	"Some stress, but coping" or "little stress, coping very well"	"Light alcohol use, seldom or never drink"	"Quit smoking >10 years ago" or "never smoked"	"Within recommended" or "lean"	"Regular exercise" or "vigorous exercise"

ous answers to this question included "always," "sometimes," "never," and "not sure." The question related to remission was, "Has your psoriasis ever disappeared completely?" All the patients were interviewed and examined by the first author. Careful attention was given to elicit the periods of remission(s), psychosocial stresses, and duration of tobacco and alcohol use. If remission(s) occurred before using tobacco/alcohol or before the appearance of stresses, those episodes of remission were not correlated with the respective factors. It is difficult for individuals to keep records of body weight and exercise schedules; therefore, obesity and exercise were not correlated with remissions. With respect to statistical analysis of the 5 risk factors, cross-tabulation for remission and a 1-tailed *t* test assuming equal variance were applied.

**Results**

Five factors were examined in this study: stress, alcohol use, smoking, weight, and exercise. These factors were correlated with the severity (mean and median percentage involvement of skin) and remission of psoriasis. There was a positive correlation between stress and percentage of skin involvement. With respect to percentage involvement, we found that the median involvement for stressed patients (n=41) was 10% compared with 6% for nonstressed patients (n=63). Severity of psoriasis was classified into 3 groups: less than 5%, 5 to 10%, and more than 10%. At less than 5% involvement, 32.5% of patients were stressed; at between 5% and 10% involvement,

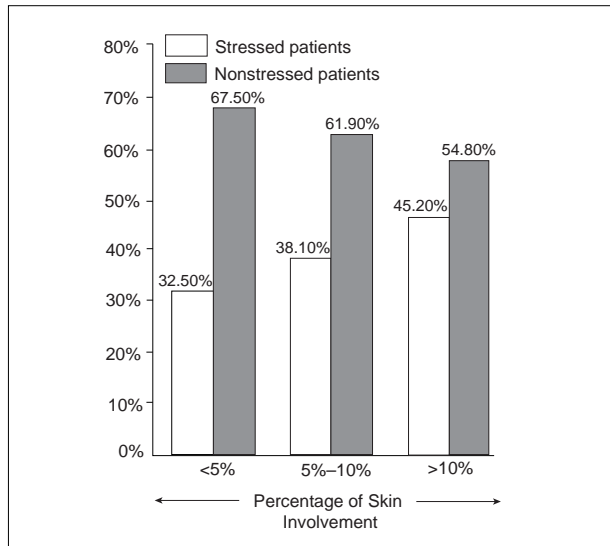
38.1% were stressed; and at more than 10% involvement, 45.2% were stressed. With the increased percentage involvement of skin, the number of patients who were stressed increased (Figure 1). Stress correlated with a higher percentage involvement (21.6 ± 24.7), and absence of stress correlated with a lower percentage (14.3 ± 16.9) involvement (*P*<.05).

Stress was also analyzed using remission as the outcomes measure. With respect to those patients who experienced remission(s), 69% were not stressed, and 31% were stressed. Of those patients who did not experience remission, 73% were stressed, and 27% were not stressed.

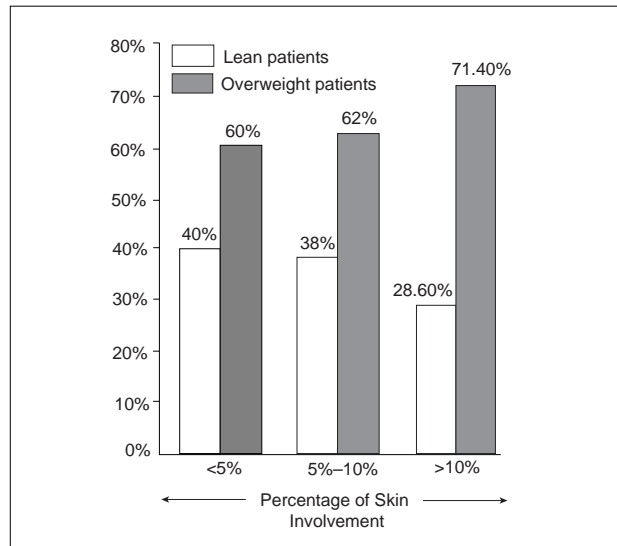
The median percentage involvement associated with high alcohol use was 5%, and it was 10% with low alcohol use. Of patients who experienced remission, 63% were low alcohol users, and 37% were high alcohol users. Among patients who did not experience remission, 79% were low alcohol users, and 21% were high alcohol users.

The median percentage involvement associated with not smoking was 8%, and it was 10% for smoking. Among the patients who experienced remission(s), 78% were nonsmokers, and 22% were smokers. Among patients who did not experience remission, 34% were nonsmokers, and 66% were smokers.

The median percentage of skin involvement for lean patients was 5%, and it was 12% for overweight patients. The percentage of involvement was also classified into the 3 previously mentioned categories. At less than 5% involvement, 40% of the patients



**FIGURE 1.** Severity of psoriasis (percentage of skin involvement) in stressed and nonstressed patients.



**FIGURE 2.** Severity of psoriasis (percentage of skin involvement) in lean and overweight patients.

were lean, and 60% weighed more than their recommended body weight. At between 5% and 10% involvement, 38% of the patients were lean, and 62% weighed more than their recommended body weight. At more than 10% involvement, 28.6% were lean, and 71.4% weighed more than their recommended body weight. As the severity increased, fewer patients were lean and more were over their recommended body weight (Figure 2). The median percentage involvement associated with a high exercise level was 5%, and with a low exercise level, it was 10%.

**Comments**

Both genetic and environmental factors play a role in the pathogenesis of psoriasis.<sup>10,11</sup> Much can be learned regarding the specific roles of various exogenous and endogenous factors that can contribute to the morbidity of psoriasis. The results of this study suggest that emotional stress, alcohol use, smoking, obesity, and lack of exercise have adverse affects on psoriasis.

The relationship between stress and morbidity of psoriasis is widely accepted.<sup>12-15</sup> According to various reports, stressful events affect the course of psoriasis in 37% to 80% of patients.<sup>2,11,12,16,17</sup> Studies have demonstrated that psychological interactions such as hypnosis and biofeedback are helpful in the treatment of psoriasis.<sup>18-21</sup> Our results provide additional evidence that emotional stress significantly affects the course of psoriasis. In this study, we have documented that patients with higher levels of stress had a greater surface area involvement with psoriasis compared with patients with relatively low stress levels. We also have found that remissions were less frequent in patients with higher levels of stress.

How stress affects the inflammatory process of psoriasis is not clearly understood. There is now substantial agreement that the body's response to stress is an integrated interaction of the nervous, endocrine, and immune systems. In addition to the classic neuroendocrine response, the peripheral nervous system is involved with the stress response. Stress alters substance P (SP) levels in the central nervous system and in the periphery.<sup>22</sup> Neuropeptides released from the sensory nerves can directly affect various immune cells through the specific neuropeptide receptors.<sup>23,24</sup> This field of study is known as psychoneuroimmunology. For the last 10 years, Farber et al<sup>25-27</sup> have been applying concepts of psychoneuroimmunology to patients with psoriasis. Correlating the clinical observation that stress exacerbates psoriasis and the symmetrical distribution of psoriatic lesions, Farber et al<sup>25</sup> proposed a role for neuropeptides in the pathogenesis of psoriasis. The theory suggests that the release of SP and other neuropeptides from unmyelinated sensory nerve fibers in the skin causes local neurogenic inflammatory responses that trigger psoriasis in a genetically predisposed person.

There is now substantial evidence that neuropeptides such as SP, calcitonin gene-related peptide (CGRP), and vasoactive intestinal peptide (VIP) play a significant role in the pathogenesis of psoriasis. Elevated levels of SP, CGRP, and VIP in psoriatic lesions also have been reported by a number of authors.<sup>28-30</sup> In the results of a double-labeled immunofluorescence study, we have recently reported that SP- and CGRP-positive nerve fibers are more dense in a psoriatic plaques than in normal controls.<sup>28</sup> In tissue culture studies, it has been shown that SP,

CGRP, and VIP induce proliferation of keratinocytes and endothelial cells.<sup>31-33</sup> These neuropeptides are also chemotactic for neutrophils and degranulate mast cells.<sup>34,35</sup> In addition, SP activates T lymphocytes<sup>36</sup> and induces expression of adhesion molecules.<sup>35,37</sup>

The relationship between body weight and severity of psoriasis observed in this study is striking. The median percentage of involvement of psoriasis in the overweight patients was 12%, compared with 5% in the lean patients; with the increased severity of psoriasis, the percentage of overweight patients increased (Figure 2). Several factors may be responsible for the increased severity of psoriasis in overweight persons. Friction and localization of microbes in the intertriginous areas may elicit a local Köbner phenomenon.<sup>1</sup> Stretching of skin by underlying fats, especially in the dependent areas of the body, such as the lower abdomen, may be another factor.

Results of this study demonstrate that psoriasis is more extensive in overweight persons (Figure 2). Results of a study by Naldi et al<sup>9</sup> also showed that the risk of psoriasis correlates with increased body mass index. This suggests that dieting and exercise may be helpful in the treatment of psoriasis. We have observed that among overweight patients, only 13.6% exercised regularly. The value of exercise is supported in this study by the observation that the median percentage of involvement of psoriasis among patients associated with a high exercise level was 5%, compared with a 10% involvement in patients who did not have a regular exercise schedule. How exercise relates to psoriasis is unclear. Exercise, in addition to its effect on obesity, is an excellent form of relaxation. Results of earlier studies have reported that stress-reduction programs such as biofeedback, meditation, progressive relaxation, hypnosis, and visual imagery are beneficial for patients with psoriasis.<sup>18-21</sup> At the Psoriasis Research Institute, we encourage our patients to follow the exercise guidelines published by the American Heart Association.<sup>38</sup>

No specific diet has shown any beneficial therapeutic effect. We recommend a balanced diet with optimal calorie intake adjusted to the patient's ideal weight. For those with medical problems, other dietary programs need to be chosen according to patient needs.

Clinicians have observed that alcohol use and smoking may have a deleterious effect on psoriasis. Braathen et al<sup>39</sup> have reported that men with psoriasis consume more alcohol than nonpsoriatic individuals. Chaput et al<sup>4</sup> have reported a significantly higher incidence of psoriasis in alcoholics. Additionally, it has been suggested that abstinence from alcohol decreases the severity of psoriasis.<sup>5</sup> However, in this study, we did not find a correlation between the severity of psoriasis

and alcohol consumption with respect to percentage of body involvement and remission.

There are reports suggesting a greater risk of psoriasis among smokers compared with nonsmokers.<sup>6,7</sup> In this study, we have not evaluated the risk for psoriasis in relation to smoking. Our data indicate that smoking may be a contributory factor to the chronicity of psoriasis; 77% of patients who did not smoke had one or more episodes of remission, whereas the incidence of remission among patients who smoked regularly was 8.7%.

How alcohol use and smoking affect the clinical course of psoriasis is unclear. It is well known that addictions to alcohol and tobacco are often associated with various psychosocial factors. In addition, chronic use of alcohol and tobacco predisposes to fatal diseases such as stroke, peptic ulcer, coronary artery disease, and malignancies. It is possible that stress generated from health problems and psychosocial factors contributes to the increased morbidity of psoriasis.

Understanding the risk factors of psoriasis is essential to providing comprehensive, effective care. A treatment regimen that does not control the exogenous and endogenous factors responsible for the increased severity of psoriasis is only partially effective. Patients with psoriasis would benefit from practicing stress-reduction techniques, abstaining from drinking and smoking, performing regular exercise, and maintaining a healthy diet. At the Psoriasis Research Institute, we have initiated the Total Care Program, consisting of exemplary skin care along with control of the associated factors that affect the morbidity of psoriasis. Total care encompasses the following: a complete physical examination, an evaluation of the type and extent of psoriasis, the Personal Wellness Profile questionnaire to measure patients' current health status, a psychological examination, the teaching of stress-reduction techniques, and a patient education program (eg, a self-help/mutual aid group). We expect that patients adhering to a total care program will require fewer medications and have longer periods of remission.

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