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# Definition of Sensitive Skin: An Expert Position Paper from the Special Interest Group on Sensitive Skin of the International Forum for the Study of Itch

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**Sensitive skin is a frequent complaint in the general population, in patients, and among subjects suffering from itch. The International Forum for the Study of Itch (IFSI) decided to initiate a special interest group (SIG) on sensitive skin. Using the Delphi method, sensitive skin was defined as "A syndrome defined by the occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to stimuli that normally should not provoke such sensations. These unpleasant sensations cannot be explained by lesions attributable to any skin disease. The skin can appear normal or be accompanied by erythema. Sensitive skin can affect all body locations, especially the face". This paper summarizes the background, unresolved aspects of sensitive skin and the process of developing this definition.**

**Key words:** sensitive skin; itch; definition; SIG; IFSI; pruritus.

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Sensitive or reactive skin (1, 2) is a common condition that affects many people. Although this syndrome is commonly discussed by patients and the media, there is a lack of a clear definition and diagnostic guidance from dermatologists. Approximately 50% of individuals (60% women and 40% men) report having reactive skin (3), although this patient-reported prevalence varies across European countries (4), the USA (5), Japan (6), Brazil and Russia (7).

Sensitive skin is probably related to neuronal mechanisms (8), and it has been shown that there are arguments for neuropathic pain/itch as a factor of sensitive skin (9). Recently, a systematic study of the putative causes of sensitive skin showed a decrease in the density of intra-epidermal nerve fibres as a consequence of the alteration of these nerve endings (10). Abnormal muscle contraction related to decreased adenosine triphosphate (ATP) synthesis

as well as lower skin pH and adiponectin deficiency may also be related to this phenomenon (11). Further research is needed to better understand sensitive skin because the pathophysiology is still debated.

Because itch is a prominent symptom of sensitive skin, the International Forum for the Study of Itch (IFSI) decided during the 7<sup>th</sup> World Congress on Itch (Boston, 2013) to initiate a special interest group (SIG) on this topic. The members of the SIG are the authors of this position paper. While a group should provide much better estimates than even the most skilled individual (12), Surowiecki proposed and justified that the following conditions must be met for a group to be knowledgeable: diversity of expertise, independence, decentralization and aggregation (13). The members of the SIG were chosen due to their status as known experts on itch and/or sensitive skin from different countries; the group comprises dermatologists, psychologists and biologists. All members of the SIG are academics and no one is employed by a cosmetic company. Conflicts of interest are provided.

Although the concept of sensitive skin was initially introduced by Frosch & Kligman (14) and Thiers (15) in the 1970s, the definition was rather vague. Therefore, the first task of the SIG was to define sensitive skin.

## METHODS

The Delphi method (12, 16, 17) was used; this method is based on the assumption that group judgements are more valid than individual judgements. Although the method has many variants, the key elements are as follows (12):

- A facilitator organizes the Delphi study.
- The facilitator recruits a group of individuals with some expertise on the topic.
- The facilitator compiles a questionnaire with a list of statements that the experts rate for agreement.
- The facilitator gathers responses from the members of the group using the questionnaire.
- The facilitator gives anonymous feedback to individuals on how their responses compare with those of the rest of the group.
- Group members are able to revise their responses to the questionnaire after receiving the feedback.
- Responses converge across rounds of questionnaires, with a specified statistical criterion used to define consensus.

This methodology was used to obtain a consensual definition of sensitive skin. After discussion during meetings and via email, a definition was proposed. Group members, who are the authors of this paper, voted on the definition. The strong agreement of at least 75% of all experts was considered to establish consensus. If such agreement was not reached in the first round, a discussion took place among all experts, followed by a second round of voting. The aim was to obtain a definition approved by all participants.

## RESULTS

In the 1<sup>st</sup> round, participants were asked to answer 2 questions: (i) Do you approve of this definition of sensitive skin? "The occurrence of erythema and/or unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to multiple factors, which may be physical (ultraviolet (UV), heat, cold, and wind), chemical (cosmetics, soaps, water, and pollutants), and occasionally psychological (stress) or hormonal (menstrual cycle)". (ii) If not, which modification do you propose?

Some participants provided remarks about erythema, which, in their opinion, is not a factor for sensitive skin and can be related to underlying facial dermatoses. Others emphasized the link between the intensity or concentration of triggering factors and the occurrence of irritation, but not sensitive skin.

In the 2<sup>nd</sup> round, participants were asked to approve or reject the following definition of sensitive skin: "The occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to stimuli that normally should not provoke such sensations". Everyone approved this definition, but some participants suggested amendments.

A 3<sup>rd</sup> round was organized, and the following definition was approved by 85% of the voters: "Sensitive skin is defined by the occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to stimuli that normally should not provoke such sensations. These symptoms may or may not be accompanied by erythema. Sensitive skin is not limited to the face".

A 4<sup>th</sup> round was organized because some participants proposed to define sensitive skin as a syndrome. The word was approved by 75% of the voters. Consequently, there was a discussion about its relationship with skin diseases.

In the 5<sup>th</sup> round, all voters approved the following final definition: Sensitive skin is a syndrome defined by the occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to stimuli that normally should not provoke such sensations. These unpleasant sensations cannot be explained by the lesions attributable to any skin disease. The skin can appear normal looking or be accompanied by erythema. Sensitive skin can affect all body locations, especially the face.

## DISCUSSION AND FURTHER QUESTIONS

The major task of our group was to provide the most accurate definition of sensitive skin in order to be able to

perform representative studies on its epidemiology and clinical characteristics. The major strength of the current definition is the fact that it was elaborated after an extensive discussion including the application of the Delphi process and approval by all co-authors from various countries and continents independently of any commercial influence. However, as limitations, we would consider the fact, that sensitive skin is defined mostly on the patients' complaints and cannot be precisely confirmed by any objective measurements. Furthermore, the definition is rather general and, in fact, may cover different conditions under the umbrella term of sensitive skin. Future studies are needed to establish the specificity and sensitivity of this definition.

The agreed-upon definition of sensitive skin as a skin sensory syndrome is probably the best choice to separate it from other skin disorders or diseases as was originally suggested by the first authors (14, 15). The proposed definition is more specific. There was debate over the inclusion of erythema in the definition. Although erythema is traditionally associated with sensitive skin, it is not compulsory (18). Erythema has been identified in 74% of cases of sensitive skin (19). Moreover, the presence of erythema in patients with sensitive skin does not imply that the erythema is due to sensitive skin, as sensitive skin is sometimes associated with skin diseases, particularly atopic dermatitis (AD) (20). AD is not the only dermatosis that can be associated with sensitive skin; in fact, some authors propose to define a subcategory of sensitive skin associated with dermatological diseases (for example: AD, rosacea, psoriasis, seborrhoeic dermatitis, acne, etc.) (21).

Although initially described with regard to the face and commonly considered to be a facial syndrome, it is clear that sensitive skin is not limited to the face (19, 22). Sensitive skin may occur on any area of the body, scalp (23) and genital area (24).

Sensitive skin is an independent syndrome, though it can be associated with AD, another skin disease or with an atopic predisposition (which does not mean that this person currently have or has ever had AD). However, epidemiological data are missing.

This precise definition of sensitive skin may bring previous epidemiological studies (3–6, 25–29) into question. In addition, skin is frequently not sensitive, but can be slightly, moderately or severely sensitive. Scales with which to assess skin sensitivity have been proposed (30, 31). Scale assessments show that there are large variations between subjects and that there is no clear delineation between subjects without sensitive skin and patients with sensitive skin. A defined cut-off based on empirical data is required, as are proper tools with which to assess sensitive skin.

Multiple epidemiological studies on sensitive skin have only been performed in the USA. These studies were performed in 2002 (25), 2006 (29), 2011 (5) and 2013 (27), and comparisons of the results suggest an increase in the

prevalence of sensitive skin (27). However, this putative increase, as well as differences according to country, sex and age, underline the subjectivity of the patients' responses. Further questions arise about the relationship between the prevalence of sensitive skin and awareness of the syndrome, as well as psychological, cultural and environmental factors.

Triggering factors of unpleasant sensations in sensitive skin can be physical (UV, heat, cold, and wind); chemical (cosmetics, soaps, water, and pollutants); and, occasionally, psychological (stress) or hormonal (menstrual cycle). The diversity of triggering factors suggests that there may be an abnormal activation of sensory receptors from the transient receptor protein family because these proteins are the only proteins known to be activated by physical and chemical factors (32). However, the causes of sensitive skin remain unknown and may be multivariate due to physiological variations, genetic susceptibility, environmental factors (e.g. drugs, cosmetics, detergents, pollution) or psychological and behavioural factors (e.g. stress, picking).

Finally, many questions remain about the relationship between chronic itch and sensitive skin: what is the role of sensitive skin in the development of chronic itch? Is sensitive skin a risk factor for the development of chronic itch? What is the role of sensitive skin as a cofactor in chronic itch of mixed origin? Is there a relationship with atopy, as suggested previously (29)? Is there any underlying chronic inflammation? These questions need to be answered in future research studies.

*Disclosures:* LM: BASF, Beiersdorf, Bioderma, Clarins, Johnson & Johnson, Jonzac, L'Oréal, Noreva, Pierre Fabre, Sofibel, Solabia and Uriage. SS: Allmiral, Astellas, Beiersdorf, Chugai Pharma, Creabilis, Daiichi Sankyo, Kneipp, Maruho, Merz, Nerre, Nufornix, Trevi, Vanda, Ziarco. JS: AbbVie, Actavis, Actelion, Adamed, Amgen, Astellas, Berlin Chemie Mennarini, Biogenetica, Celgene, Egis, Fresenius, GSK, Janssen Cilag, Leo Pharma, Lilly, Merck Serono, Mitsubishi Pharma, Novartis, Pierre Fabre, Polfarma, Regeneron, Sandoz, Takeda, Toray, UCB Pharma, Vichy. AR: Abbvie, Actavis, Actelion, Amgen, Eli Lilly, GlaxoSmithKline, Janssen-Cilag, LEO Pharma, Novartis, Pfizer, Pierre Fabre Medicament, Regeneron, Trevi. JW, AE, KT, EB: none declared. CLG: L'Oréal, Pierre Fabre. JF: none declared. EB: Abbvie, Janssen-Cilag, Johnson & Johnson. EW: Fresenius.

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