Review

Sensitive skin: An update on the aesthetic medicine management through a mini review and a focus on dermocosmetics

Elisabetta Fulgione[1], Maura Secchi[2], Josephine Di Paolo[3], Maria Veraldi[3], Giuseppe Alessandrini[3], Elisabetta Bianchi[3], Silvia Robuffo[4,5], Emanuele Bartoletti[6]

[1]Dermatology Clinic, Luigi Vanvitelli University of Campania, Naples (Italy); [2]Università Cattolica del Sacro Cuore, International School of Aesthetic Medicine of the Carlo Alberto Bartoletti Foundation, Rome (Italy); [3]Private Practice, Rome (Italy); [4]Dermatology Unit, IRCCS Azienda Ospedaliero-Universitaria, Bologna (Italy); [5]Department of Medical and Surgical Sciences, University of Bologna, Italy; [6]Outpatient Service of Aesthetic Medicine and psychophysical wellbeing in pathological patients, Isola Tiberina - Gemelli Isola Hospital, Rome (Italy)

Abstract *Background:* Sensitive skin is a condition characterized by an exaggerated response to environmental, chemical, and physiological stimuli, often manifesting as discomfort, itching, burning, and redness. It is a global and common condition with a reported prevalence of 50-70% in the adult population, with symptoms varying widely in severity and triggers. Furthermore, sensitive skin is often associated with conditions like rosacea and atopic dermatitis. The underlying etiopathogenetic mechanism of sensitive skin is multifactorial, involving a compromised skin barrier, heightened nervous system outputs, and dysregulated immune system responses. *Aim:* To summarize current literature on sensitive skin, elucidate its underlying mechanisms, and provide guidance for management strategies to support affected individuals in daily life. *Methods:* A mini review of recent literature was conducted, focusing on the pathophysiology, prevalence, associated conditions, and management approaches for sensitive skin. *Results:* The high prevalence of the condition has led to summarize in this mini- review current literature and to comment the latest data available to support subjects with sensitive skin in their everyday life. Management of sensitive skin involves a combination of avoidance of known triggers, use of gentle skincare products formulated to minimize irritation, and maintenance of a healthy skin barrier. Components such as ceramides, hyaluronic acid, and niacinamide are commonly recommended for their soothing and barrier-repairing properties. *Conclusions:* Effective management of sensitive skin requires a tailored treatment focused on protection, hydration, and the least possible product use to reduce the risk of exacerbations and maintain skin health.

Key words: sensitive skin, dermocosmetics, atopic skin, itching, redness

Introduction

Sensitive skin is a global and common condition with a reported prevalence of 50-70% in the adult population (around 60% women and 40% men)[1,2]. This condition or syndrome, rather than a disease, is defined as the appearance of unpleasant sensations in response to stimuli normally not provoking such perceptions[3]. Sensitive skin can occur, but it is not limited, to the face, as any other body area can be affected, including the scalp and genital area[4-6].

During the aesthetic medicine consultation, the evaluation of sensitive skin is fundamental and should be routinely assessed at the first visit. The presence or

absence of this condition allows aesthetic physicians to set up a complete counseling and dermocosmetic program aimed at improving the subjects' wellbeing. Indeed, sensitive skin can be impacted by potential triggering factors including chemical ones (e.g., cosmetic, soap)[4]. Consequently, a need for specific counseling is required.

The high prevalence of the condition and the possible beneficial role of a complete aesthetic medicine evaluation and management have led us to review current literature and to comment the latest data available to support individuals with sensitive skin in their everyday life.

Methods

A definite number of topics has been chosen by the authors:

1. definition, pathophysiology, associated conditions and diseases;
2. diagnosis;
3. dermocosmetics and sensitive skin.

For the first two topics, articles available in the English language were selected from Pubmed database from 2018 to current days, whereas for the third one the keywords "sensitive skin" AND "dermocosmetics" AND "cosmetics" have been used.

Results

A total of 656 articles has been found according to the keywords "sensitive skin" and "cosmetic", and 15 with "sensitive skin" and "dermocosmetic".

Definition, pathophysiology, associated conditions and diseases

In 2017 the Special Interest Group on Sensitive Skin of the International Forum for the Study of Itch defined sensitive skin 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.*"[4]. Regarding skin appearance, it can be normal or accompanied by erythema[4].

Multiple factors interplay and contribute to sensitive skin, both intrinsic (e.g., age, hormonal changes) and extrinsic[7,8]. Environmental factors include cosmetics, detergents, and air pollutants[4]. The pathophysiology of sensitive skin has been linked to three main dimensions: neurogenic, immune-related and skin barrier function related[3]. Sensitive skin is increasingly understood as a condition involving alterations in cutaneous small nerve fibers, particularly unmyelinated C fibers responsible for mediating pain, itch, and warmth[4,9]. These fibers are equipped with sensory neuroreceptors, including endothelin receptors and transient receptor potential vanilloid (TRPV) channels, which are also expressed by keratinocytes. Their activation triggers the release of neuropeptides such as substance P and calcitonin gene-related peptide (CGRP), which in turn induce vasodilation, immune cell recruitment, and the phenomenon of cutaneous neurogenic inflammation[9] (Figure 1). In addition to neurosensory hyper-reactivity, epidermal barrier impairment contributes to symptom onset and persistence. Reduced stratum corneum integrity increases skin permeability, facilitating the penetration of irritants and allergens, and further amplifying inflammatory responses[10,11].

Sensitive skin is outlined as an independent syndrome, and has been associated with certain diseases and conditions, such as rosacea and atopic dermatitis[4,6]. Moreover, authors report the frequent association of sensitive skin with irritable bowel syndrome or sensitive eyes[12,13].

Diagnosis

In 2022, Misery et al. mention patient-reported outcome as the most reliable method for diagnosis of sensitive skin and sensory testing methods (e.g. stinging test with lactic acid) as a mean to support the evaluation[9]. Among the methods for assessing sensitive skin, a scoring system based on 10 and 14 items has been developed (Sensitive Scale-10 and Sensitive

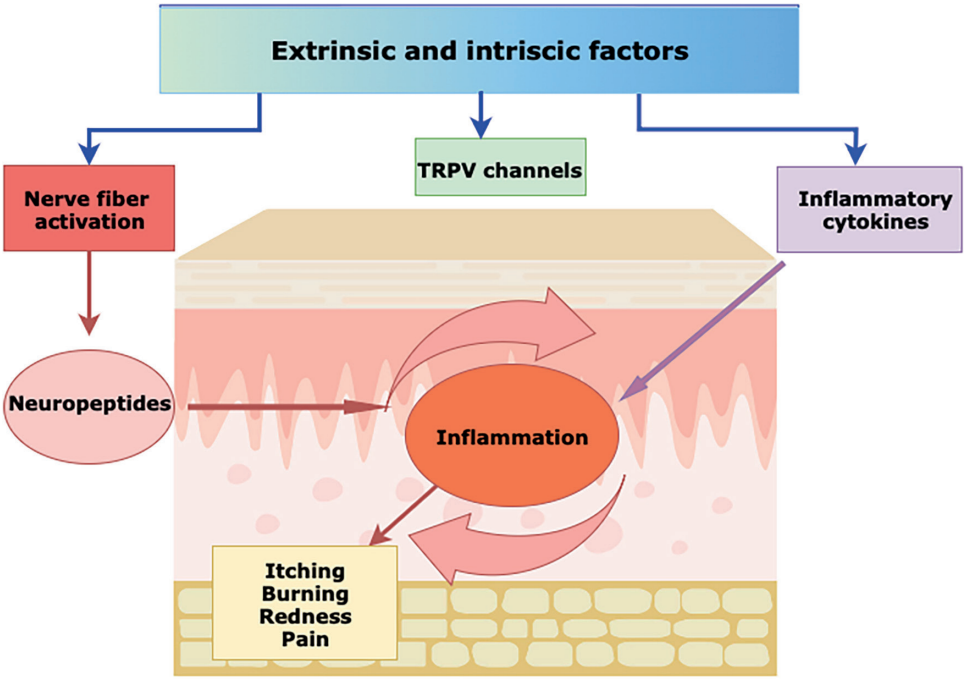

Figure 1. Pathophysiology of sensitive skin. Extrinsic and intrinsic factors trigger excessive activation of nerve fibers (via TRPV and other channels), leading to the release of neuropeptides and cytokines, collectively promoting cutaneous inflammation.

Scale-14) with the first one to be preferrable[14]. A cut-off value of 12.7 has been suggested in a study including a total of 160 women[15].

The lactic acid stinging test (LAST) has been widely used and it is part of the so-called Mediskin® check-up protocol defined by Carlo Alberto Bartoletti and Gaston Ramette[16-18]. False positives (e.g. due to seborrheic skin at the nasolabial folds) should be taken into consideration when performing and evaluating the test.

Dermocosmetics and sensitive skin

Topical cosmetics can be a potential triggering factor for sensitive skin, therefore, the use of well-tolerated formulations and dermocosmetics with soothing properties has been recommended, highlighting the need for high-tolerance products (e.g., free of preservatives)[9].

Studies on dermocosmetic formulas for sensitive skin have been carried out in recent years and an improvement in skin sensitivity has been reported[19-21]. Endpoints used for sensitive skin evaluation were mainly clinical and instrumental, such as transepidermal water loss (TEWL). However, in a study by Kerob et al. emotional endpoints (electrodermal response and verbatim/semantic analysis) were included as well[20].

Daily skin care for individuals with sensitive skin should also include other aspects, in particular cleansing: appropriate formulas should be used in a gentle cleansing routine, avoiding scrubbing with mechanical devices or exfoliating products[22]. Complementary care should also include sunscreens that are specifically designed and formulated for sensitive skin[22] (Table 1).

Discussion

The aesthetic medicine visit needs to assess sensitive skin in the first consultation and evaluate the condition development during follow-ups, along with

Table 1. Dermocosmetics for sensitive skin.

Condition	Individual need	Dermocosmetic	Formulation
Sensitive skin	Daily cleansing	Product: [22] • With a pH in physiological range (5.5-6.0) • Fragrance and alcohol free • With mild amphoteric o anionic surfactant • With hydrating element (glycerin, hyaluronic acid) • Whit relipidization component (ceramides, vegetable oils)	Non-occlusive product with a lightweight texture
	Photoprotection	Sunscreen designed for sensitive skin [22]	
	Reduce skin inflammation and redness [20] Restore natural skin barrier [20]	• Niacinamide [19] • Acetyl Dipeptide-1 Cetyl Ester [20] • Nicotinamide [22] • ADE-G3 [21] • Tocopherol [19] • Vitamin E [19] • 4-t-butylcyclohexanolm (TRPV1 inhibitor)[23]	Cream [20], moisturizers [20,22]
Allergic contact dermatitis, rosacea, intolerance to cosmetic care,	Reduce skin inflammation [20] Improve sensitive skin [20] Restore natural skin barrier [20]	• Niacinamide [20] • Fractions of the probiotic *Sphingomonas* Ferment Extract [20] • Acetyl Dipeptide-1 Cetyl Ester [20] • Neurosensine [22] • Nicotinamide [22] • ADE-G3 [21] • Tocopherol [19] • Vitamin E [19]	Cream [20], moisturizers [20,22]

an overall and comprehensive diagnostic and skin care management program. Indeed, association with other conditions and/or skin diseases should be verified to properly counsel refer the subject to other specialists when needed.

Sensitive skin syndrome needs to be taken into consideration because it can alter the quality of life, especially in women[20].

A punctual protocol in Aesthetic medicine was defined more than 50 years ago by Carlo Alberto Bartoletti and Gaston Ramette: the so-called Mediskin® check-up[17,18]. The protocol, defined Aesthetic Medicine Program, includes a complete anamnesis, clinical and instrumental evaluations to support aesthetic, trained medical doctors in assessing the skin status ("biotype") and the subjects' needs to design a tailored treatment plan[17,18]. An Aesthetic medicine evaluation should provide counseling on a healthy lifestyle and potential aggravating factors for specific conditions and diseases, a specific dermocosmetic skincare regimen and, if needed, a referral to other specialists[17,18].

People with sensitive skin can be affected by various external stimuli. Thus, it is of the utmost importance to know about possible conditions and factors that need to be limited and/or avoided as much as possible.

Dermocosmetics are part of the management of sensitive skin, particularly daily skin care with soothing formulas and high tolerance products (e.g. no preservatives where available). The skin biotype (normal skin; skin with increased content of superficial lipid [up to seborrhea, dry skin]) will help the aesthetic doctor select the most appropriate formula: for example, if a subject has dry skin, dermocosmetics with a richer formula could be preferred, whereas in case of seborrheic skin, lighter ones are indicated[24]. All daily skin care aspects should be addressed, including cleansing with products tailored to the individual's skin needs, along with recommendations on photoprotection and sunscreen use. Nowadays, formulas improving skin sensitivity with different actions (e.g., skin barrier restoration, soothing) are available and can help subjects in their daily life.

Conclusions

Aesthetic medicine physicians should be trained in the appropriate and complete assessment of sensitive skin, associated conditions, diseases, and needs to provide an omni-comprehensive management plan based on punctual protocols. The Mediskin® check-up protocol might be the first step to assess the skin status, including sensitive skin, and individuals' needs to design a tailored aesthetic medicine program. However, further studies are needed to better elucidate the underlying mechanisms of sensitive skin and explore potential new treatments.

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Correspondence:
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Maura Secchi, MD Università Cattolica del Sacro,
International School Carlo Alberto Bartoletti Foundation,
Rome (Italy)
Email: maurasecchi2018@gmail.com