Reconstructive Surgery & Anaplastology

Short Communication

Sensitive skin syndromes and transient receptors potential (TRP) channels in sensitive skin diseases

Chan Kam Tim Michael

Abstract

Sensitive skin syndrome is a common and important clinical condition not only to the dermatologists but also to the skin care products and cosmetic manufacturing industries. Conditions like psoriasis, rosacea, contact and atopic dermatitis are associated with it. The perception of itch is translated to our brain by neuronal depolarization signals initiated by aberrant transient receptor potential (TRP) channels mainly TRPV1, TRPV3, TRPV4 and TRPA1 through a complex inflammatory cascades and mediators. The discovery of these mediators and pathways not only broaden our understanding of the skinâ nervous system interaction during the body innate response to adversity but also may provide therapeutic solution to a number of diseases which share similar pathogenesis and etiology. In this lecture, we will discuss the biology of various TRP channels and their pathophysiological roles in skin diseases like sensitive skin syndromes, rosacea, atopic dermatitis, contact dermatitis and abnormal hair diseases. Some local data on studies of sensitive skin will be presented. In addition, some potential therapeutic agents targeted the TRP channels in skin diseases will be addressed.

Sensitive Skin (SS) is a significant, global, complicated, clinical and public health problem with increasing prevalence. Patient experience subjective sensory symptoms after the application of sensitive skin care products. On top of that, the subjectivity in symptomatology and the presence of transient erythema increase the difficulty in diagnosing SS. The clinical course is unclear and not fully understood scientifically. SS is associated with underlying severe chronic skin diseases. The subsequent apprehension leaves both the patients and managing dermatologists feel perplexed. It is not uncommon for SS patients to demonstrate severe psychological affects during clinical consultations. SS has been shown to affect patients' Dermatology Quality of Life (DQOL) with major disease burde. Medical legal disputes and litigations may follow after life-threatening skin diseases, both infectious and pre-cancerous are mismanaged as SS or vice versa. The dishonest and misleading labelling of the ingredients in the skin care products may also prompt investigations by health authority

With the absence of confirmatory diagnosis, severity assessment, long term outcomes and possible complications of SS, the sensitive skin syndromes are still not fully understood. AD, dry skin associated dermatitis and rosacea are well associated with sensitive skin as they share similar pathogenetic mechanisms especially the epidermal barrier defects and TRP channels abnormalities. A cost-effective and standardized patient self-reported questionnaire and a suspicion on skin sensitivity history should point to the direction of SS diagnosis. Counselling, education, explanation during consultation are essential. Public health education should be reinforced to advice the public to choose appropriate skin care products for their own skin based on their level of skin sensitivity. The public especially those required to apply makes-up and cosmetics products on their jobs should be vigilant in contaminated, irritable and even toxic skin care products widely promoted in the markets and internets. Through disentangling the relationship between the pathogenesis of sensitive skin and TRP channels and TRPV1 antagonist, it indicates that trans-4-tert-butylcyclohexanol and licochalcone are effective in treating sensitive skin. Pimecrolimus down regulates TRP receptors, decrease TWEL and may increase epidermal thickness. Low energy level laser and intense pulse light has been shown to reduce the severity of sensitive skin. Intense pulse light and pulse dye laser are also known to be effective and harmless treatment modalities in managing Rosacea which may link with SS.

Sensitive skin is a prevalent skin condition. There are inadequate scientific data available to the practicing dermatologists and the general public to prevent and manage the disease. Skin barrier defects, cutaneous nervous system hypersensitivity, TRP channels and immune dysfunction together with their interaction provide a plausible pathogenesis of SS. Pharmacogenetic research on TRP ion channels receptors including TRPV1,TRPV3, TRPV4, TRPA1 and TRPM1 and imaging studies like Magnetic Resonance Imaging of the CNS including the brain and its circuitry may shed light on this complicated disease. This may also enlighten us on the close interaction between skin, brain and subjective perceptual motor behavior in SS. Dermatologists should shift from the unilateral to a more dualistic, integrative approach to skin diseases like SS and Skin Sensitivity Syndrome (SSS). Pharmacological studies and clinical trials involving TRP Ion Channels blockers and activators may provide new targeted drug therapy in managing SS and its associated syndrome as well as conditions including adult Atopic Dermatitis and Rosacea which are difficult to treat

This work is partly presented 17th European Dermatology Congress March 01-03, 2018 | Paris, France

Chan Kam Tim Michael
Hong Kong Academy of Medicine, China E-mail: pioneerskin@ymail.com