Skin inflammation is regulated by multiple pathways and inflammatory mediators. The activation and/or deactivation of certain mediators can influence how the skin responds to certain irritants. Research has shown that topical application of certain plant extracts may be able to regulate the expression of inflammatory mediators. Narcissus Tazetta Bulb Extract, a bulb extract from the daffodil plant family has been used topically to delay cellular proliferation. Schizandra Chinensis Fruit Extract, a red berry fruit extract belonging to the magnolia plant family, has been used for decades in Chinese medicine to promote general well-being and vitality when taken orally. Research on these two extracts individually has shown that they have effective anti-inflammatory benefits when taken orally. However there is limited research on the anti-inflammatory benefits for topical applications on either of these extracts. Recent in–house unpublished clinical studies involving these extracts in finished topical formulations have led to the hypothesis that when combined, Narcissus Tazetta Bulb Extract and Schizandra Chinensis Fruit Extract may be able to reduce skin inflammation. This research investigates the in vitro effect of a proprietary blend of these extracts on genes related to skin inflammation when applied topically.

METHODS AND MATERIALS

A combination of Narcissus Tazetta Bulb Extract (0.2%) and Schizandra Chinensis Fruit Extract (0.5%) was applied to human full-thickness 3D epidermal equivalents (FTEE, MatTek, Ashland, MA). One hundred microliters of the test article was applied to each culture and incubated for 24 hours. Following incubation, the cultures were thoroughly washed with sterile phosphate buffered saline to remove test materials and consequently placed in RNAlater solution for gene expression analysis. qPCR analysis was carried out using Custom Taqman Low Density Arrays (TLDA); created by Life Technologies (Foster City, CA). An Applied Biosystems 7900HT instrument was used for amplification and fluorescence detection. Data analysis was carried out according to RQ analysis using RQ Manager and StatMiner (v3.1) software.

RESULTS

Results showed that a combination of Narcissus Tazetta Bulb Extract (0.2%) and Schizandra Chinensis Fruit Extract (0.5%) reduced the expression of four key genes associated with skin inflammation while increasing the expression of four key genes related to anti-inflammation. The expression of genes such as PTAFR and LTBR4 were lowered, indicating a possible role of these two extracts in addressing inflammation via the arachidonic acid pathway. The expression of histamine receptor 1 gene (HRH1) was also lowered, showing potential in itch mediation of these two extracts. ERBB2, a gene known to stimulate the expression of various UV-induced pro-inflammatory mediators was also downregulated. Along with decreasing the expression of pro-inflammatory mediators, Narcissus Tazetta Bulb Extract and Schizandra Chinensis Fruit Extract also increased the expression of genes related to anti-inflammation. IL1RN, interleukin 1 receptor antagonist was increased. Research has shown that IL1RN may play a role in the regulation of IL-1 induced inflammatory responses, and an appropriate balance between IL-1 and IL1RN may help to maintain homeostasis of the skin. Metallothioneins, which helps in wound healing and also help regulate immune response from irritants were also increased. See Table 1 for a summary of genes and their role in inflammation.

CONCLUSION

The findings from this study suggest a possible role of a combination of Narcissus Tazetta Bulb Extract and Schizandra Chinensis Fruit Extract on skin inflammation when applied topically.

REFERENCES