Ｐ２. Inhibitory effects of mineral-balanced deep sea water on atopic dermatitis-like inflammation in HaCaT human keratinocyte and Nc/Nga mice

°Kyung-Soo Nam · Kyu-Shik Lee · So-Young Chun · Min-Gu Lee[1)],

Deok-Soo Moon · Hyeon-Ju Kim[2)] and Je Sun Uh[3)]

[1)]Department of Pharmacology, School of Medicine, Dongguk University, Gyeongju, Korea
[2)]Seawater Utilization Plant Research Center of Ships & Oean Engineering (KRISO) Goseong, Korea
[3)]Department of Deep Ocean Water, Kyungdong University, Goseong, Korea

Abstract

Anti-inflammatory effects of deep sea water (DSW) were reported by several studies. Here, we investigated effects of mineral-balanced DSW [Mg:Ca = 3:1] on atopic dermatitis (AD)-like inflammation in HaCaT immortalized human keratinocyte and Nc/Nga mice. The result showed mineral-balanced DSW suppressed COX-2 expression, a pro-inflammatory protein, in TNF-α- and IFN-γ-treated HaCaT cells. Furthermore, mineral-balanced DSW regressed TNF-α- and IFN-γ-induced inflammatory chemokines and cytokines, such as thymus- and activation-regulated chemokine (TARC/CCL17), macrophage-derived chemokine (MDC/CCL22), and regulated on activation, normal T-cell expressed and secreted (RANTES/CCL5), granulocyte-macrophage colony-stimulating factor (GM-CSF) and interleukin (IL)-6, expression through the inhibition of signal transducer and activator and transcription (STAT)-1 phosphorylation. In addition, we observed that decreased transcriptions of filaggrin and involucrin, which are major components of stratum corneum, by TNF-α and IFN-γ were recovered with supplement of mineral-balanced DSW in HaCaT cells. In addition, animal (Nc/Nga mice) experiment showed lower levels of serum IgE, IL-4 and histamine in DNCB-treated mice applied with hardness 2,000 of mineral balance DSW than in the DNCB-alone group. Besides, severity score was improved by treatment of hardness 2,000 of mineral-balanced DSW. Taken together, present investigation shows that mineral-balanced DSW is a potent substance improving skin inflammation caused by AD.

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