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The anti-inflammatory effect of Aptamin C on house dust mite Extract-Induced inflammation in keratinocytes via regulation of IL-22 and GDNF production

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Atopic dermatitis (AD), a chronic inflammatory skin disease, is characterized by eczemous lesions on the skin that manifest as severe itching and last a long time. AD is thought to be a response to local allergens, including house dust mites (HDMs). Aptamin C is a modified form of vitamin C comprised of aptamers (DNA fragments) that bind specifically to vitamin C and inhibit its oxidation, thereby increasing its stability and antioxidant effects. It is already known that vitamin C shows an anti-inflammatory effect on skin inflammation. Oxidative stress is one of the major causes of inflammatory diseases, including HDM-induced skin inflammation, suggesting that the antioxidant activity of Aptamin C could regulate inflammatory responses to HDMs in the skin keratinocyte cell line HaCaT and primary skin keratinocytes. Aptamin C not only inhibited HDM-induced proliferation of both type of cells, but suppressed HDM-induced increases in interleukin (IL)-1α and IL-6 production by these cells. In addition, Aptamin C suppressed the production of IL-17 and IL-22 by T cells, which are closely associated with AD pathogenesis, as well as HDM-induced IL-22Rα expression. Aptamin C also reduced the production of thymus and activation-regulated chemokine (TARC) by suppressing the interaction between IL-22 and IL-22Rα, as well as reducing T cell migration. Although HDM treatment markedly increased the expression of glial cell line-derived neurotrophic factor (GDNF), which is associated with itching in AD skin lesions, this increase was reduced by Aptamin C treatment. Taken together, these results suggest that Aptamin C can effectively regulate inflammatory lesions, such as AD, by regulating the production of inflammatory cytokines and GDNF induced by HDM.

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