Involvement of epidermal VEGF in the pathogenesis of melasma through PAR-2 upregulation

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Melasma is a common acquired symmetrical hypermelanosis which often affects the sun-exposed area of oriental woman. The pathogenesis of melasma is not fully understood. Recently, vascular endothelial growth factor (VEGF) expression of epidermal keratinocyte was reported higher in melasma lesional skin compared to perilesional normal skin. But, role of VEGF in melanogenesis of melasma is unknown. Protease-activated receptor-2 (PAR-2) activation has been reported to increase keratinocyte phagocytic activity which is important mechanism of melanosome transfer. To evaluate the role of VEGF and PAR-2 in the pathogenesis of melasma, we retrospectively examined skin biopsy specimen which had been made a histologic diagnosis of melasma. On the histological examination of immunofluorescent staining for PAR-2, increased expression level of PAR-2, especially at the suprabasal keratinocyte, was observed. We conducted in vitro study to investigate the relation between VEGF and PAR-2 expression. Increased PAR-2 mRNA levels and protein levels were noted in VEGF treated co-culture cells with keratinocytes and melanocytes. These findings suggest that epidermal VEGF may play an important role in the melanogenesis of melasma partially through upregulation of PAR-2.

Key Words : Protease-activated receptor-2, vascular endothelial growth factor, melasma