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〈一般論文〉

皮膚毛細血管の老化メカニズムに関する研究

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Research on Aging Mechanism of Cutaneous Capillary Vessels

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Abstract

The capillary vessels distributing the dermis have an important role for supplying oxygen and nutrients to cells, besides collecting discharged carbon dioxide and waste matters from cells. It has been previously reported that the reduced functions of cutaneous capillary are observed with aging, which causes delayed turnover of epidermis and decrease of skin elasticity, *etc.* Therefore, it is considered that the capillary functions might play a critical role on skin aging. The mechanism of capillary aging, however, has not been explored very well until today. Then, we investigated the mechanism of capillary aging using normal human dermal microvascular endothelial cells (HMVEC). In aging-induced HMVEC, mRNA level of angiotensin IV receptor (AT_4) that takes part in plasminogen activator inhibitor-1 (PAI-1) production, was increased, followed by up-regulation of PAI-1 mRNA and protein level. Moreover, PAI-1 accelerated the collapse of tube-like structure formed by HMVEC. At this time, mRNA level of vascular endothelial growth factor receptor-3 (VEGFR-3) that takes part in the adhering of endothelial cells and the maintenance of tube-like net structure, was decreased. On the basis of these results, increase of AT_4 with aging is considered to accelerate PAI-1 production, which induces the collapse of tube-like structure by down-regulation of VEGFR-3.

Key words: capillary vessel, aging, AT_4, PAI-1, HMVEC.