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Effects of oral administrations of some traditional Chinese formulations on smooth muscle cells proliferation in rat artery after balloon catheter denudation

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Objectives: Effects of eight traditional Chinese formulations (TCFs) on smooth muscle cells (SMCs) proliferation were examined to estimate the preventive effect of TCFs on restenosis after percutaneous transluminal coronary angioplasty (PTCA). Although PTCA is widely used to treatment for coronary artery disease, 40-50 % of restenosis after PTCA is observed. Intimal SMCs proliferation seems to be one of the mechanisms of restenosis.

Methods: Restenosis model was generated by the balloon catheter denudation of the rat carotid artery endothelium. Eight TCFs (Tsumurus & Co.) used for syndromes attendant on hypertention and atherosclerosis are orally administered from 3 days before to 7 days after the denudation. Tranilast is used as a positive control.

PCNA-labeling index: Inhibitory effect on proliferation intimal SMCs in cross sections of the left carotid artery extirpated 7 days after denudation was examined. By immuno-histochemical method using monoclonal antibody against proliferating cell nuclear antigen (PCNA), PCNA-labeling index (%) is calculated from (PCNA positive SMCs) x 100 / (total SMCs)

Stenosis rate: From the observation in the cross sections of the carotid artery using NIH image analysis system (NIH 1.62), stenosis rate (%) is calculated from (intima area) x 100 / (intima area + lumen area).

Results & Discussions: TCFs for “clearing away heat” as Dai-joki-to, Oren-gedoku-to and Saiko-ka-Ryukotsu-Borei-to decreased PCNA labeling index and Stenosis rate more than TCFs for “worming the interior” as Shichimotsu-Koka-to, Shakanzo-to and Toki-to. The former effective TCFs are classified in formulations for promoting the circulation of “*Blood* and *Qi*” in Chinese pharmacology (*Yaku-no* in Japanese). They are fit for syndromes as palpitation, disturbance and irritant caused by “stagnation of Blood and *Qi* (*oketsu* and *kitai* in Japanese)” in coronary artery disease. Among them, Saiko-ka-Ryukotsu-Borei-to, a sedative formulation for regulation the flow of *Qi* (*riki-zai* in Japanese), is effective in dose-dependant manner. The mechanisms of its effects are under investigation from viewpoints of SMCs cell cycle and etc.

Since restenosis after PTCA is regarded as “accelerated atherosclerosis”, TCFs effectiveness which we showed in this experiments may imply therapeutic potential for the treatment in atherosclerosis derived from long-term inappropriate life-style.