

## **Recent advances in prevention and treatment of ischemic stroke.**

○Kortaro Tanaka (Department of Neurology, Toyama University Hospital)

In Japan, the population of bed-ridden people amounts more than 320,000 and 40% of them are due to various neurological sequelae caused by stroke. Among various types of stroke, cerebral hemorrhage had been substantially more frequent than ischemic stroke (cerebral infarction) until 30 years ago. Recently, the mortality by ischemic stroke has been three times higher than that by cerebral hemorrhage in Japan, because the incidence of cerebral hemorrhage has been significantly decreased mainly due to improved control of blood pressure in general population. By contrast, the incidence of ischemic stroke has been gradually increasing due to increased numbers of aged people and westernization of life style promoting atherosclerosis.

Many evidences regarding the beneficial effects of antihypertensive agents have been accumulated for prevention of ischemic stroke. For the primary prevention of ischemic stroke, all the types of antihypertensive agents such as diuretics,  $\beta$  blockers, Ca antagonists, ACE (angiotensin converting enzyme) inhibitors and ARB (angiotensin type 1 receptor blocker) have been proved to be efficient, suggesting that lowering blood pressure itself is critical. On the other hand, only ACE inhibitor with diuretics and ARB have concrete beneficial evidences for the secondary prevention (prevention of reattack) of ischemic stroke, suggesting that some class effects of agents may contribute to the effects.

Among lipid lowering agents, statins have shown significant effects in the primary prevention of ischemic stroke, and recently one of these statins has also been shown to be useful in the secondary prevention of ischemic stroke. A large scale clinical trial in Japan proved that EPA -E(eicosapentaenoic acid-ethyl ester)(1800mg/day) is very effective in the secondary prevention of ischemic stroke.

Anti-platelet agents (aspirin, clopidogrel and cilostazol) and anti-coagulant (warfarin) are now widely used for the secondary prevention of ischemic stroke. Clinical trials abroad have shown that aspirin with dipyridamol has been shown to be superior to aspirin alone, and the same trial is now being conducted in Japan.

Treatment against the acute ischemic stroke has been advancing very much in recent years, including the use of tissue plasminogen activator and free radical scavenger.