The purpose of this study was to evaluate the effects of SM-6586 (SM), a new calcium entry blocker, on cardiovascular lesions of SHR and compare the effects with those of nicardipine (Nic).

< Materials and Methods >  Ten 23-week-old SHR were treated with SM (30 mg/kg/day, p.o.) and ten with nicardipine (30 mg/kg/day, p.o.) for 12 weeks. Ten untreated SHR of the same age served as controls. Before, 4 and 12 weeks after treatment, we measured systolic blood pressure and heart rate by the tail-cuff method. Left atrial and left ventricular (LV) dimensions were serially determined using echocardiography with a 7.5 MHz transducer. After the last noninvasive examinations, LV pressure was recorded with a high fidelity, catheter-tip transducer. The time constant during LV isovolumic relaxation was determined automatically by a signal processor according to the method of Weiss and the animals were sacrificed. Both ventricles, both atria, aorta and mesenteric artery were weighed. The wall area to the luminal area ratio of small arterial level was planimetered from transverse tissue sections of the hearts and the kidneys.

< Results >  Blood pressure decreased significantly 4 weeks after the treatment in SM-treated rats compared to controls (p<.05), but not in Nic-treated animals. Blood pressure decreased 12 weeks after treatment in both SM- and Nic-treated group (p<0.01 and 0.05, respectively). During the whole treatment period, heart rate was significantly lower in SM-treated but not in Nic-treated SHR than that of controls. LV mass index calculated from echocardiographic dimensions was smaller in both SM- and Nic-treated animals than that in controls at both the 4th and 12th week (SM; 2.53±0.24, Nic; 2.62±0.13 vs 2.91±0.11, p<0.01, 0.01 at the 4th week, SM; 2.45±0.30, Nic; 2.57±0.12 vs 2.82±0.21, p<0.01, 0.05 at the 12th week). For left atrial dimension, both SM- and Nic-treated SHR had lower values than controls (SM; p<0.01, Nic; p<0.05). Only in SM-treated rats, the minimum dp/dt (-4447±244 vs -6088±772 mmHg/sec, p<0.01) and the relaxation time constant (11.7±0.61 vs 13.7±1.3 ms, p<0.05) were lower than those in controls. The weight of the left ventricle was significantly lower in both SM- and Nic-treated rats than that of controls, as were those of left atrium, aorta and mesenteric artery. For the weights of aorta and mesenteric artery, SM-treated SHR showed lower values than Nic-treated SHR (p<0.05 and 0.05, respectively). In Nic-treated rats, the ratio was smaller only in the renal artery (p<0.05).

< Conclusions >  Both SM and Nic showed inhibitory effects on the progression of cardiovascular lesions in SHR. The effects of SM were more potent than those of Nic, and SM had beneficial effects additionally to improve impaired LV diastolic property in SHR.