

Alterations of lymphocyte count and platelet volume precede development of stroke-related symptoms in stroke-prone spontaneously hypertensive rats

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Stroke is a global health problem and leads to disability. Efficacy of current treatment in both acute and chronic phase of stroke is limited. To accelerate individualized approach to primary prevention for stroke, identification of biological parameter, which is able to predict the risk of stroke development, is an indispensable component. Stroke-prone spontaneously hypertensive rat (SHRSP) is genetic animal model of chronic hypertension that progresses to stroke. Most of SHRSP spontaneously develop stroke including cerebral infarction and cerebral hemorrhage. Hematological tests readily provide health condition information. In this study, we investigated the time course of hematological parameters in Wistar rats and SHRSP. SHRSP develop stroke-related symptoms including onset of neurological symptoms, decreased body weight and blood brain barrier leakage between 12 and 14 weeks of age. Lymphocyte counts were gradually decreased at 3 weeks before development of stroke-related symptoms and then were further decreased after the development of stroke-related symptoms. The platelet volume, as shown by the mean platelet volume and large platelet ratio, gradually increased at 3 weeks before the development of stroke-related symptoms. However, although SHRSP showed more microcytic red cells than Wistar rats, the trajectories of change in erythrocyte-related parameters were similar between Wistar rats and SHRSP. Our findings suggest that alterations of lymphocyte count and platelet volume may be predictive indicators for stroke development in SHRSP.