

Is the Imbalance of the Amounts of Cerebellin and Renalase in Brain responsible for Cerebral Stroke?

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Editorial

World health organization (WHO) defines stroke as 'Presence of rapidly developing clinical findings due to focal or global impairment of cerebral function and these findings may last 24 hours or longer and/or cause death' and the stroke is divided into three main categories: intracranial hemorrhage, subarachnoid hemorrhage, and cerebral infarction [1]. There are many factors which can cause stroke including cardioembolism, vascular occlusion and hypertension [2]. For example, Charcot-Bouchard microaneurysm rupture in the penetrating arteries due to hypertension is the main cause of intracerebral hemorrhage [3]. In other words, the cause of stroke due to bleeding is rupture of the brain vein [4]. The most important cause of this condition is the high blood pressure [2]. This editorial is hypothesizing that there may be a direct link between cerebral hemorrhage (stroke) and the amount of cerebellin [5] and renalase [6,7]. That is, the main synthesis site of cerebellin is brain and it is released from the adrenal gland [2]. Cerebellin is responsible for epinephrine release via adenylate cyclase/PKA-dependent signaling [8]. The excess of epinephrine is associated with high blood pressure [9]. Renalase (mainly released by the kidneys and other tissues including the brain) can mediate to metabolize a large amount of catecholamines, that is, dopamine (homovanilic acid), epinephrine, and norepinephrine (3-methoxy-4-hydroxymandelic acid (vanilmandelic acid, VMA) [6,7]. In this case, if cerebellin leads to an excessive amount of epinephrine release and the brain renalase expressing cells are also suffering from atrophy due to age or other causes; epinephrine accumulates in the brain because epinephrine cannot be metabolized due to inadequate renalase release and which may lead to an increase in intracranial tension and thus to cerebral hemorrhage. It is not yet known whether renalase in the peripheral circulation crosses the blood brain barrier or not.

However, since a protein with a molecular weight of 38 kDa is sufficiently large [6,7], it is theoretically impossible to pass the blood brain barrier. It is suggested that the measurement of cerebellin and renalase in brain hemorrhages may have the potential to become two new biomarker candidates to benefit the diagnosis and follow-up of the disease.

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