

## CASE REPORT

# Clinical analysis of acute cerebrovascular disease accompanying brain-heart syndrome

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Acute cerebrovascular disease (ACVD) induced cardiovascular dysfunction, myocardial infarction, myocardial ischemia, arrhythmia and heart failure and so on, which is defined as brain syndrome. Brain syndrome will cause not only cerebrovascular disease prolonged, but also sometimes can result in death. Our department admitted and analysed 22 cases of acute cerebrovascular disease induced brain heart syndromes, in order to achieve early diagnosis, correct treatment, reduce the rate of death from December in 2013 to November in 2014.

## 1 Clinical case data

### 1.1 General information

22 Cases were hospitalized patients, 16 males and 6 females. Aged 60 to 84 years, mean 73 years old. By Scanning the head of CT or MRI, it was confirmed that there were subarachnoid hemorrhage in 12 cases, cerebral hemorrhage in 7 cases, cerebral infarction in 3 cases. At the time of admission, 5 cases are in the coma state, 10 cases are in different degrees of language disorder.

### 1.2 Diagnostic criteria

(1) The diagnosis of acute cerebrovascular disease: sudden nerve system dysfunction and confirmed by head CT or MRI scan; (2) Cardiovascular function can be diagnosed by the obstruction: by colourful Doppler ultra-

sound examination, confirmed the heart of the patient room, valve, aorta, pulmonary artery and pericardium were not abnormal; ECG or Holter monitoring arrhythmia, ST segment decline, T wave significantly increased (Niagara Falls Such as changes in U waves, abnormal J wave, etc.); increased myocardial enzymes, especially in phosphate acid kinase, muscle - brain mixed creatine phosphatase isoenzyme increased significantly; (3) Anxious the incidence of cerebrovascular disease before the onset of heart symptoms in acute cerebrovascular disease for 6 h - 7 d; (4) Previous cases of similar cardiac damage are not included in the brain syndrome analysis.

### 1.3 Treatment and results

(1) Cerebral infarction patients were cured by anticoagulation, thrombolysis, defibrillation, anti-platelet aggregation and improve micro-circulation; (2) Hemorrhagic cerebrovascular disease patients were cured by dehydration reduce intracranial pressure, protect brain tissue and symptomatic support; (3) Protecting the myocardium. By hospital monitoring and hospital tracking (except for the death of 5 cases), 17 patients with current arrhythmia, myocardial abnormalities and ECG changes gradually returned to normal with the stability of the brain lesion and complete recovery more than a month later.

## 2 Discussion

The pathogenesis of acute cerebrovascular disease with brain syndrome is unclear and may be related to the following factors: the lesion involving the thalamus the lower part and the brain stem of the autonomic nerve regulation center, the occurrence of sympathetic nervous tension, adrenal cortical hyperfunction and blood catecholamine content increased, the occurrence of neurogenic fluid conditioning dysfunction and pulmonary

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edema. In addition, according to the literature reported, frontal lobe frontal cortex lesions and island lesions can cause autonomic and cardiovascular dysfunction.<sup>[1]</sup> At the same time, acute cerebrovascular disease due to the application of dehydrating agents, electrolyte disorders, blood liquid concentration, the emergence of low potassium, low sodium, hypoxia, resulting in neurological disorders. Also by in some hemorrhagic brain disorders, the use of hemostasis or coagulant causes blood hypercoagulable state, can affect the heart function, causing a series of ECG changes. Acute cerebrovascular disease occurs in the elderly, and often associated with high blood pressure, diabetes, hyperlipidemia and other diseases affect the heart and brain blood, easy to cause heart change. In addition, brain-heart syndrome may be the intrinsic effect of encephalopathy.<sup>[2]</sup>

From the diagnosis point of view, acute cerebrovascular disease is more exposed, easy to diagnose, while the onset of heart symptoms hidden, often due to the onset of patients older and past no history of coronary heart disease and neglect. In the diagnosis and treatment of acute cerebrovascular disease must be highly alert the possibility of the occurrence of brain heart syndrome, once the following circumstances should be taken into account concurrent heart symptoms of the possibility: ECG abnormalities such as ST segment decline or elevation, T wave increased significantly (Niagara Falls change), Q-T interval extension, U wave obviously, abnormal J wave and so on. Arrhythmia is mainly manifested as sinus tachycardia (slow), various types of atrioventricular block, atrial fibrillation, ventricular contraction before wait. ECG abnormalities in the 6h-7d after the onset of abnormal waveforms are sustainable for 1 to 2 weeks, while the elderly up to 4 weeks.

From the incidence point of view, each reported different, 62% to 90% ECG different often, the highest incidence of subarachnoid hemorrhage, cerebral hemorrhage abnormal ECG. Secondly, followed by a large area of cerebral infarction can also occur, indicating bleeding stroke patients the impact on the heart than ischemic stroke patients.<sup>[3,4]</sup> In the subarachnoid space of this group, the highest incidence of bleeding was 54.55%, followed by cerebral hemorrhage (31.81%), cerebral infarction dead (13.64%). The incidence of hemorrhagic stroke complicated with brain - heart syndrome (86.36%) was significantly higher than that of ischemic stroke (13.64%) ( $P < 0.01$ ). Literature reports are basically the same.

From the treatment point of view, there are contradictions to treat the acute cerebrovascular disease complicated with brain-heart syndrome. During ACVD, most people advocate salt-based to the liquid input, and need limit the amount of salt to cardiac patients. In addition, for ACVD, particularly for bleeding brain vascular disease, the patients need to be given dehydration to reduce intracranial pressure, but the application of dehydrating agent mannitol can induce or aggravate heart symptoms, and most of the patients with ACVD disturbance of consciousness can not eat, required the amount of liquid more, which will increase the heart dirty burden. Therefore, in the treatment, the doctor need to weigh the pros and cons. If the heart dirty ischemic damage, the treatment is similar to cerebral infarction; if patients are with hemorrhagic cerebrovascular disease or large area of cerebral infarction with heart symptoms, the doctor should be strictly master dehydration treatment indications, the application of dehydrating agent with furosemide or glycerol fructose, without nectar alcohol to reduce the burden on the heart, to avoid heart failure, and pay attention to dehydration treatment of concurrent disease. The purpose of the treatment of cerebral infarction with cardiac drugs is to increase the amount of cardiac output, thereby increasing plus cerebral blood flow, so that the ischemic penumbra be restored, therefore, the application of cardiac drugs do not to be conservative, such as early in the presence of heart damage, including pulmonary edema, kidney changes.

Dynamic observation of ECG and myocardial enzymes in 22 patients with brain accompanying heart syndrome showed that it is meaningful for stroke patients to prevent brain-cardiac syndrome in the treatment of primary disease.

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