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A Review of Treatment of Acute Ischemic Stroke

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Abstract: Treatment strategies for acute ischaemic stroke focus on two main areas: improving blood circulation to the brain and neuroprotection. However, these measures are only effective in the treatment of vascular stenoses. However, they are only effective within a narrow therapeutic window and are therefore limited. This article now provides a brief summary of the clinical treatment of acute ischaemic stroke and its future directions, with the aim of providing an updated direction and theoretical basis for relevant drug development.

Keywords: Acute Ischemic Stroke; Intravenous Thrombolysis; Intravenous Thrombolysis

1. Introduction

Stroke is the leading cause of death and disability worldwide, and the economic costs of treatment and post-stroke care are enormous[1]. Many factors are closely associated with the onset of stroke, including age, gender Acute ischaemic stroke is a condition in which the brain is damaged by the activation of neurons, astrocytes and oligodendrocytes.Treatment strategy of stroke focuses on improving cerebral circulation and neuroprotection[3].

2. Intravenous thrombolysis

The lysis technique has become the most commonly used treatment for vascular disease today. It uses the action of enzymes to dissolve the clot in the blood vessel, thus breaking up the clot in the vessel, and can effectively remove the tissue from the clot, thus improving the quality of life of the patient.Recent studies have found that thrombus composition may have a significant impact on the outcome of mechanical endothrombectomy, including a reduction in the number of recanalisation procedures, lower resistance to recovery and improved thrombolytic capacity. In a recent study, analysis of retrieved stroke thrombi revealed 2 main thrombotic zones with varying composition: (1) red cell-rich, fibrin-poor zones; or (2) platelet-rich, fibrin-rich zones.Embolism containing fibrinogen is associated with increased recanalisation operations, delayed treatment and poor clinical outcomes compared with embolism containing red blood cells. In general, intravenous thrombolytic therapy is the most effective means of managing severe ischaemic stroke, but his disadvantages are a tightly controlled time window, strict indications and the potential for serious adverse effects such as haemorrhage.

3. Endovascular therapy

In recent years, endovascular therapy has become an important tool for the diagnosis and treatment of acute ischaemic stroke, including mechanical thrombectomy and arterial thrombolysis techniques, which can significantly improve patient survival and prognosis [10-12]. Nevertheless, there are still many issues that need to be addressed. Firstly, how to select the right patients for the procedure, especially those who are not suitable for intravenous thrombolysis; and secondly, whether all patients can benefit from endovascular treatment Endovascular mechanical thrombectomy is performed by delivering an appropriate stent directly to the site of thrombotic occlusion, locally closing the stent, thereby creating a complete union between the cerebral embolus and the stent, and then slowly retracting the stent, where the stent and vessel will form The slow retraction creates friction between the stent and the vessel, using the adsorption function of the stent in the middle of the vessel to gradually bring up the cerebral embolus; arterial thrombolysis, on the other hand, is accomplished by introducing the catheter directly into the corresponding occluded vessel through an interventional device; and arterial thrombolysis technology can effectively inject thrombolytic drugs into the lesion of cerebral embolism quickly, thus achieving effective treatment. More revascularisation can be achieved and the risk of cerebral haemorrhage reduced, but this benefit is offset by delayed initiation [13]. Overall, endovascular treatment remains an important direction.

4. Antiplatelet therapy

Anti-platelet cell therapy is also one of the cornerstones of prevention in patients with ischaemic stroke. It reduces platelet clotting in damaged capillaries, thereby reducing cerebral embolism and clot production, keeping capillaries open [3], inhibiting the continued development of acute cerebral infarction and reducing its serious consequences. However, there are still many patients who have doubts and misconceptions about this approach. Therefore, there is a need to enhance knowledge dissemination in clinical practice to help patients understand and actively participate in antiplatelet therapy. Therefore, it is important to strengthen the prevention and treatment of stroke and to continuously explore and improve antiplatelet therapy protocols to reduce the incidence of stroke and disability.

5. Anticoagulation

In the acute phase of acute ischaemic stroke, anticoagulation may not be the only treatment, but rather because there is insufficient medical information to suggest that anticoagulation can prevent early recurrent stroke and thus prevent further deterioration of peripheral nervous system disease, thereby reducing mortality and disability and promoting recovery of peripheral nervous system function. In such cases, anticoagulation may be seen as a stopgap measure. However, in patients with other risk factors (e.g. hypertension, diabetes, etc.) or at risk of bleeding, anticoagulation should remain the first-line treatment option.Finally, anticoagulation therapy is not suitable for all people and needs to be considered in the context of individual differences. In conclusion, anticoagulation is an important secondary prevention measure that should not be overlooked, but should not be misused either.

6. Neuroprotective agents

Neurological monitoring has been one of the mainstays of ischaemic stroke prevention and treatment.Neuroprotective agents can reduce hypoxic damage and rescue brain cells in the hypoxic-ischaemic hemisphere by inhibiting aspects of the ischaemic cascade, thereby keeping brain cells undamaged prior to and during revascularisation, thereby extending the therapeutic window for intervention and thereby improving functional levels. As a result, there is growing interest in the development of effective neuroprotective agents.

Edaravone has emerged as an effective neuroprotective agent with multiple effects, one of the most important of which is the blocking of ion channels, the elimination of free radicals and its ability to effectively counteract oxidative induction, making it a safe and effective choice for randomised double-blind trials.

Conclusion

In recent years, progress has also been made in preventing acute ischaemic stroke and reducing the prognosis of mortality, but currently only rt-PA and MT intravenous thrombolysis are the most effective means of diagnosing acute ischaemic stroke. However, they are only effective within a narrow therapeutic window and are therefore limited. Neuroprotective therapies for neuron-focused AIS have failed. In conclusion, this paper concludes from a literature review that the pathogenesis of AIS is complex and requires a variety of approaches to prevention and treatment.

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