Editorial

**Importance of Coordination of Regional Stroke Centers for Acute Ischemic Stroke**

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**Abstract**

Acute ischemic stroke (AIS) is a devastating disease all over the world, and intravenous thrombolysis is the gold-standard treatment. Shortening the pre-hospital delay and optimizing the in-hospital process are important for improving the stroke survival rate. Clinical evidence has proven the positive influence of coordinated stroke centers and regional stroke networks on the clinical efficacy of intravenous thrombolysis for AIS patients.A coordinated stroke center and regional stroke network can significantly increase the efficacy of intravenous thrombolysis for AIS, shorten the pre-hospital delay time, and improve clinical prognosis.

**Keywords**: Regional Stroke Centers; Stroke network; Acute ischemic stroke; Intravenous thrombolysis; Clinical efficacy

Stroke is the second leading cause of death behind only cancer, and 75% of patients develop varying degrees of disability, which causes an enormous socio-economic burden. According to a recent epidemiological investigation, more than 10 million Chinese are living with stroke, with 2.4 million new cases annually. Acute ischemic stroke (AIS) is the most common type of stroke and accounts for approximately 70% of all strokes. Shortening the pre-hospital delay and optimizing the in-hospital process are key points for improving the stroke survival rate. Therefore, in recent years, China has made great efforts to establish regional stroke centers, on the basis that a coordinated system combining the pre-hospital first-aid scheduling system and the regional stroke network may effectively reduce the rate of disability and improve the patient’s quality of life.

Currently, intravenous thrombolysis is the mainstay of treatment for AIS. According to worldwide guidelines, recombinant tissue plasminogen activator (rt-PA) is the recommended first line of treatment. Cumulative clinical evidence has shown that intravenous thrombolysis with rt-PA can improve the clinical prognosis of AIS and reduce disability and mortality. However, there is a strict time window for the administration of thrombolytic agents. Shortening the pre-hospital delay is the most important issue for the treatment of AIS. As is known "time is the brain"! It has been estimated that approximately 2 million neurons may lose activity per minute before recanalization, and every 15 minutes of the pre-hospital delay may increase the mortality rate by 5 percent. Additionally, shortening the pre-hospital delay can effectively lower the risk of hemorrhagic events after thrombolysis.

Nansha District has a resident population of about 820,000, with a total area of 783.86 square kilometers. The strict time window limit of AIS indicates that the first aid of stroke should follow the nearest-location principle and that patients with AIS should be sent to the closest hospital for thrombolysis or endovascular treatment as soon as possible. Therefore, building an efficient regional stroke rescue network and strengthening intra-regional cooperation is important for improving the AIS survival rate. We have established a coordinated stroke center (Nansha Central Hospital) and regional stroke network (including 11 neighboring hospitals and an emergency medical rescue command center) since December 2017 and conducted studies aimed at investigating whether this combined system improved the clinical efficacy of intravenous thrombolysis for AIS. Years of clinical practice have shown that the Stroke Network Alliance has made great efforts in the dissemination of information regarding early identification and treatment of stroke.

After the establishment of the coordinated Stroke Network Alliance, the duration between onset and admission was significantly shortened. On the one hand, the cooperation among various departments has been improved, and the green channel in the hospital and the intravenous thrombolysis procedures have been optimized. On the other hand, the coordinated Stroke Network Alliance significantly strengthened inter-hospital cooperation. Moreover, this alliance also concentrated on improving the patients' and their families' understanding of stroke, which increases the acceptance of intravenous thrombolysis.

Although the Stroke Network Alliance significantly shortened the DNT and ONT of intravenous thrombolysis in the Nansha area, less than 50% of patients were able to arrive in the emergency room within 1 hour after the onset of AIS. Overall, there is still significant room for over-improvement of this system. Specifically, the operating efficiency of the green channel in hospitals and the general knowledge regarding identifying and treating AIS can be improved in the future.

In summary, the coordinated stroke center and regional stroke network can significantly increase the efficacy of intravenous thrombolysis for AIS. Hospitals within the network cooperate and share medical resources in clinical practice and social popularization, enabling more people to prevent the vascular risk factors of stroke as early as possible. In summary, the construction of the Stroke Network Alliance is conducive to regional cooperation and emergency referrals. In addition, the pre-hospital popularization and education can improve the recognition rate of early stroke. However, there are still some limitations to this approach, and further improvement is warranted.

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**Conflicts of interest**

The authors have no conflicts of interest to disclose.