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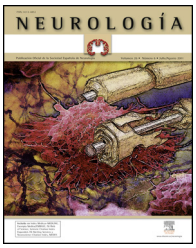

REVIEW

Guidelines for the treatment of acute ischaemic stroke☆

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KEYWORDS
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Thrombolysis;
Brain protection;
Stroke units;
Cerebral venous thrombosis

Abstract
Introduction: Update of Acute Ischaemic Stroke Treatment Guidelines of the Spanish Neurological Society based on a critical review of the literature. Recommendations are made based on levels of evidence from published data and studies.
Development: Organised systems of care should be implemented to ensure access to the optimal management of all acute stroke patients in stroke units. Standard of care should include treatment of blood pressure (should only be treated if values are over 185/105 mmHg), treatment of hyperglycaemia over 155 mg/dl, and treatment of body temperature with antipyretic drugs if it rises above 37.5 °C. Neurological and systemic complications must be prevented and promptly treated. Decompressive hemicraniectomy should be considered in cases of malignant cerebral oedema. Intravenous thrombolysis with rtPA should be administered within 4.5 hours from symptom onset, except when there are contraindications. Intra-arterial pharmacological thrombolysis can be considered within 6 hours, and mechanical thrombectomy within 8 hours from onset, for anterior circulation strokes, while a wider window of opportunity up to 12—24 hours is feasible for posterior strokes. There is not enough evidence to recommend routine use of the so-called neuroprotective drugs. Anticoagulation should be administered to patients with cerebral vein thrombosis. Rehabilitation should be started as early as possible.
Conclusion: Treatment of acute ischaemic stroke includes management of patients in stroke units. Systemic thrombolysis should be considered within 4.5 hours from symptom onset.

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Intra-arterial approaches with a wider window of opportunity can be an option in certain cases. Protective and restorative therapies are being investigated.

PALABRAS CLAVE
Infarto cerebral;
Ictus isquémico;
Trombólisis;
Cerebroprotección;
Unidades de ictus;
Trombosis venosa cerebral

Guía para el tratamiento del infarto cerebral agudo

Resumen
Introducción: Actualización de la guía para el tratamiento del infarto cerebral agudo de la Sociedad Española de Neurología basada en la revisión y análisis de la bibliografía existente sobre el tema. Se establecen recomendaciones en base al nivel de evidencia que ofrecen los estudios revisados.
Desarrollo: Los sistemas de asistencia urgente extrahospitalaria se organizarán para asegurar la atención especializada de los pacientes y el ingreso en unidades de ictus (UI). Deben aplicarse cuidados generales para mantener la homeostasis (tratar la tensión arterial sistólica > 185 mmHg o diastólica > 105 mmHg, evitar hiperglucemia > 155 mg/dl y controlar la temperatura, tratando con antitérmicos cifras > 37,5 °C), y prevenir y tratar las complicaciones. La craniectomía descompresiva debe ser considerada en casos seleccionados de oedema cerebral maligno. La trombólisis intravenosa con rtPA se administrará en las primeras 4,5 horas en pacientes sin contraindicación. La trombólisis intraarterial farmacológica puede indicarse en las primeras 6 horas de evolución y la trombectomía mecánica hasta las 8 horas. En el territorio posterior la ventana puede ampliarse hasta 12—24 horas. No hay evidencias para recomendar el uso rutinario de los fármacos denominados neuroprotectores. Se recomienda la anticoagulación en pacientes con trombosis de senos venosos. Se aconseja el inicio precoz de rehabilitación.
Conclusiones: El tratamiento del infarto cerebral se basa en la atención especializada en UI, la aplicación urgente de cuidados generales y el tratamiento trombolítico intravenoso en las primeras 4,5 horas. La recanalización intraarterial farmacológica o mecánica pueden ser útiles en casos seleccionados. Terapias de protección y reparación cerebral están en desarrollo.

Since the publication of the most recent recommendations by the SEN Study Group for Cerebrovascular Diseases (GEECV/SEN),[1] there have been substantial improvements in some aspects of acute management of patients with cerebral ischaemia. This article provides updated recommendations on the care framework, general care for patients with acute-phase stroke, and specific treatment for ischaemia or for cerebral venous sinus thrombosis. Grades of recommendation and the scientific evidence supporting them are classified according to Centre for Evidence-Based Medicine (CEBM) criteria (Table 1).[2]

Care frameworks, 'code stroke', and stroke units

Stroke is a neurological emergency because the injury mechanisms following cerebral ischaemia or haemorrhage progress very quickly and treatments may only be effective during a short period of time. Highly effective and specific treatments are available, but their risk/benefit margin is narrow. With this in mind, organisational frameworks must be optimised and hospitals must be equipped and prepared to care for stroke patients.

The Helsingborg Declaration establishes the goal that all stroke patients will have easy access to diagnostic techniques (Table 2), as well as to treatments with demonstrated efficacy during the acute phase of the disease, referring specifically to access to neurological care and techniques used in stroke units (SU).[3,4] Given that these resources are expensive and it is not possible to provide them in all hospitals within a public health system with limited means, we must organise our care systems in such a way that all patients will have access, according to the characteristics of each health district.[5] This situation, plus the fact that most available treatments have a narrow therapeutic window, requires coordination between various levels of care to guarantee a minimum response time that will allow the patient to be evaluated and treated rapidly, in a hospital and by neurology specialists. To this end, implementing 'code stroke', the protocol for coordinated action by non-hospital emergency services and the hospitals that will care for the patient, has been a useful initiative. Pre-hospital 'code stroke' is the procedure that includes implementation of protocols developed by consensus, recognition of the emergency situation, and organisation of transport to suitable hospitals (those with an on-call neurologist, SU, and ability to provide specific treatments such as thrombolysis) after those hospitals have been alerted.[6—8] Pre-hospital 'code stroke' has been proved to decrease both care and treatment delays. Hospital emergency services should also organise care for these patients in order to reduce delays as much as possible. Action protocols created for this purpose are known as in-hospital code stroke, and they are also very effective (level of evidence 2a).[9—12]

Telemedicine systems that enable live communication between stroke centres of reference and hospitals lacking on-call neurologists may be useful as links to specialised resources where geographical barriers prevent or delay direct access. These systems help increase the number of