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Consensus Papers – Guidelines

Proposal of guidelines for acute stroke treatment and management

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1. Introduction

One of the tasks of the Belgian Stroke Council (BSC) is the publication of guidelines for the management of acute ischemic stroke. In the past, such guidelines were already extensively published by a special writing group of the stroke council of the American Heart Association (AHA) (1) and by the European Stroke Initiative (EUSI) (2). The aim of the BSC was to summarize these guidelines and to focus somewhat more on the specific situation in Belgium for instance by omitting pharmaceutical compounds not available in our country. In general, the BSC totally agrees with the guidelines of the AHA and the EUSI. By way of illustration, we repeat the definitions for levels of evidence (Table 1.

2. Organisation of stroke care

An acute stroke is a medical emergency that requires public education, a referral and treatment network and fast management. In case of a stroke, one should call immediately the emergency medical system (EMS) 100. Patients should be admitted in institutions with a certified emergency ward. The EMS personnel should be able to assess a person with a suspected stroke as following : assure an adequate airway, monitor vital signs, conduct a general assessment (evidence of trauma to head and neck, cardiovascular abnormalities), conduct a neurological examination : level of consciousness, presence of seizure activity, Glasgow Coma Scale, pupils (size, equality, reactivity) and individual limb movements (1).

3. Management in the emergency room

A cranial CT is still the most important diagnostic tool in patients with suspected stroke. In the nearby future, Magnetic Resonance Imaging (MRI) techniques such as Diffusion Weighted Imaging (DWI), Perfusion Weighted Imaging (PWI), Magnetic Resonance Angiography (MRA) and Fluid Attenuated Inversion Recovery (FLAIR) will play a more and more important role.

An early evaluation of physiological parameters, blood chemistry, haematology, and cardiac function is recommended in the management of acute stroke patients ; this also includes ECG, puls oximetry and chest X-ray.

Ultrasound of the extra- and intra-cranial vessels, cardiac ultrasound and special haematological and serological studies for rare causes of stroke should be performed early after stroke, but should not delay general or specific treatment.

4. Acute stroke management

4.1. General stroke treatment

Neurological status and vital functions should be monitored. Neurological status should be assessed by validated stroke scales (3), such as the NIHSS (National Institute of Health Stroke Scale)(4) or the ESS (European Stroke Scale) (5). Glucose and body temperature should be monitored and corrected, if elevated (level 3). Monitoring and correction of electrolyte disturbances are advised. Secure airways and supply oxygen to patients with severe acute stroke (level 3). Do not treat arterial hypertension in patients with ischaemic stroke, if they do not have critically elevated BP levels (level 3).

Suggested antihypertensive treatment in acute ischaemic stroke (6,7)

– *Systolic BP > 220 mm Hg on repeated measures, diastolic BP 120-140 mm Hg, or both*
  Orally :
    Captopril 6,25-12,5 mg
  Parenterally :
    Labetolol 5-20 mg IV.
    Urapidil 10-50 mg IV, followed by 4-8 mg/h I.V.
    clonidine 0,15-0,3mg I.V.or S.C.
– *Diastolic BP > 140 mm Hg* :
    Nitroglycerine 5 mg I.V., followed by 1-4 mg/h I.V.

4.2. Specific Treatment

4.2.1. *Thrombolysis*

I.V. rtPA treatment, 0,9 mg/kg, maximum of 90 mg), with 10 % of the dose given as a bolus,

followed by an infusion lasting 60 min, is recommended within 3 hours after the onset of ischaemic stroke (level 1) (8).

The benefit of the use of I.V. rtPA for acute ischaemic stroke within 3-6 hours after the onset of symptoms is smaller, but present in selected patients (level 1) (9).

I.V. rtPA is not recommended when the time of onset cannot be ascertained reliably ; this includes persons whose strokes are recognised upon awakening (level 3).

I.V. administration of streptokinase, outside the setting of a clinical investigation, is dangerous and not indicated for the management of persons with ischaemic stroke (level 1) (10, 11).

Data on the efficacy or safety of any other intravenously administered thrombolytic drug are not available to provide a recommendation.

Intra-arterial treatment of acute M1-occlusion in a 6 hour-time window using pro-urokinase results in a significantly improved outcome (level 1) (12). Currently, pro-urokinase is not available in Belgium, instead of it, one can perform an intra-arterial thrombolysis with rtPA 20-40 mg (level 4).

Acute basilar occlusion may be treated with intra-arterial therapy in selected centres (level 4) (13, 14).

Table 1

Definitions for levels of evidence (1)

Level 1 : highest level of evidence
Source
a. Primary endpoint from randomized, double-blind study with adequate sample size
b. Properly performed meta-analysis of qualitatively outstanding randomized trials

Level 2 : intermediate level of evidence
Source
a. Randomized, non-blinded studies
b. Small randomized trials
c. Pre-defined secondary endpoints of large randomized trials

Level 3 : lower level of evidence
Source
a. Prospective case series with concurrent or historical control post hoc analyses of randomized trials

Level 4 : undetermined level of evidence
Source
a. Small case series without control, case reports
b. General agreement despite lack of scientific evidence from controlled trials

4.2.2. *Antithrombotic medication*

There is no recommendation for general use of heparin, low-molecular weight heparin or heparinoids after ischaemic stroke (level 1) (15).

Full-dose heparin may be used in selected indications such as atrial fitrillation, other cardiac sources with high risk of re-embolism arterial dissection, high-grade arterial stenosis or cerebral venous thrombosis (level 4).

Aspirin 100-300 mg/day may be given after stroke to an unselected population, even without CT scan (level 1) (15).

Haemodilution therapy is not presently recommended for the management of patients with acute ischaemic stroke (level 1) (16).

Currently, there is no recommendation to treat patients with neuroprotective drugs after ischaemic stroke (level 1).

4.2.3. *Prevention and treatment of complications after stroke*

Administration of heparin or low-molecular-weight heparin in bedridden patients after stroke is recommended to reduce the number of DVT and pulmonar embolism ; however, there is a risk of additional intracranial bleeding (level 1) (15).

Infections after stroke should be treated with appropriate antibiotics ; nasogastric feeding may prevent pulmonary aspiration (level 4).

Early mobilisation is helpful to prevent numerous complications after stroke including aspiration pneumonia, DVT and decubital ulcers (level 3).

Administration of anticonvulsants to prevent recurrent seizures is strongly recommended (level 3). Prophylactic administration of anticonvulsants to patients with recent stroke who not had seizures is not recommended (level 4).

4.2.4. *Elevated intracranial pressure (ICP) and brain oedema*

Osmotherapy is recommended for patients whose condition is deteriorating secondary to increased ICP, including those with herniation syndromes (level 3) (17).

Surgical decompression and evacuation of large cerebellar infarctions that compress the brainstem is justified (level 3).

Surgical decompression and evacuation of a large hemispheric infarction can be a life-saving measure, survivors may have a residual neurological function that enables an independent life (level 3) (18).

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