The Stroke and a New Diagnostic Method

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Aims of the Project

The main aim of this project consists on making a comprehensive bibliographic research of the information related with stroke, with the purpose of understanding this disease. The information will allow an introduction of cerebrovascular injury, of its symptoms in patients and of its incidence in society.

More specifically, the treatment methods will today be sought, and an analysis of the bottlenecks or weak points of these treatments will be made, proposing improvements. In addition, taking into account the molecular mechanisms involved in the disease, a bibliographic research of articles, journals and patents will be made, in order to propose or develop a faster and safer new methodology than current methods in the diagnosis and treatment of stroke.

Stroke classification according its nature

Stroke Worldwide


Mimicking Conditions

There are also conditions which mimic stroke, called “stroke mimicking conditions”, which are not true stroke and must be properly diagnosed in order to administer a therapy compatible with the diagnosis to the patient.

The geographic distribution of case mortality (Figure 2A) appeared similar to the patterns seen for burden (Figure 2B).

The impact on Catalonia

In Catalonia, there are approximately 15,000 cases of stroke each year, according to the Grup d’Estudi de Malalties Cerebrovasculars (GEECV) from the Spanish Society of Neurology. Its prevalence, according to the Health Survey of Catalonia in 2002, is 1.8% in men and 1.4% in women, of all ages, but mostly older. More than 60% of people affected by stroke die or suffer a disability. According to the record of hospital discharge data from the Catalan Health Service, from 65 general hospitals (91% of the total) 12,335 cases defined as acute cerebrovascular disease were reported in 2002. Cerebrovascular disease brings 9.2% of global mortality in Catalonia; 7.5% in men and 11.1% in women.

Diagnosis

1. Onset of symptoms
   - Loss of strength in the face, arm or leg, along with tingling sensation.
   - Total or partial vision in one or both eyes can be lost.
   - Sudden alteration of speech.
   - Headache with sudden onset.
   - Intense feeling of vertigo, instability, imbalance or sudden drops.

2. General evaluation by extra-hospitalary services
   - If stroke is confirmed, check the medical history of the patient.
   - Other clinical and diagnostic tests will be done.

3. Hospital management
   - A clinical assessment with neurological exploration will be done according to scales.
   - Extract blood for analysis (CBC, coagulation studies...)
   - A TAC or MRI have to be done.
   - If emergency service will be necessary without the activation of stroke code.

New diagnostic method

It is clear that the time for action in this disease is very short, and lots of tests (including TC or MRI) have to be done to determine it is an ischemic stroke, hemorrhagic stroke or mimicking conditions, tests which require plenty of time. If thrombolytic treatment, like rtPA, is not given within first 6 hours from the onset of symptoms, the patient is unlikely to recover from stroke.

There are some open research lines in order to study the molecules involved in cerebrovascular injury. If it could be established whether these molecules increase or decrease its concentration during stroke, a tool that provides rapid and effective diagnosis could be designed.

Advantages

1. Replacement of current methods.
2. Improvement of diagnosis.
3. Mortality reduction of stroke patients.
4. Death and disability reduction of patients who could not receive a treatment because of slowness of diagnosis would be avoided.
5. Health expenditure reduction.

Bibliography