

Right and rapid

Diagnosing rapidly a blood clot or bleed in a stroke victim is the best chance of saving lives, as Dag Jungenfelt of Medfield Diagnostics explains

Stroke is a common disease. Every year 15 million people worldwide suffer a stroke. In Europe, it is the third most common cause of death and it is estimated that more than a million Europeans are affected by a stroke each year, which equates to two every single minute. Statistics show that about 50% either die or suffer severe disabilities, whilst the rest are left with complications of different natures, most commonly altered motor skills and speech impediments.

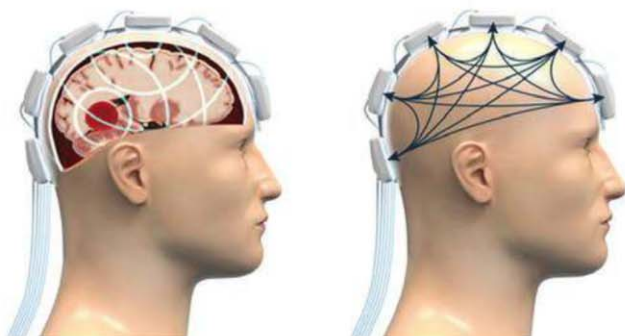
Aside from the strain on the patient, the cost for treatment and recovery presents a substantial economical strain on society at large, which was estimated to reach a yearly figure of €64bn in 2010.

Diagnosis

Stroke is a local brain injury caused by lack of oxygen and cell death due to reduced blood supply to an area of the brain. A stroke is either caused by a blood clot or it is due to an internal bleeding.

The early diagnosis of illness saves lives, such as when a medical professional is faced with diagnosing a blood clot or internal bleeding. Correct diagnosis at an early stage can save lives and prevent serious complications at a later stage for those people who have actually suffered a stroke.

The right and rapid treatment of a stroke caused by a blood clot must be treated with thrombolysis (clot-dissolving therapy) within about four hours to have an effect. It is, however, a treatment that is directly dangerous to a patient who has suffered a stroke due to a bleeding. Because a clot and a bleeding exhibit the same symptoms, the patient suffering a stroke today requires a CT or MRI scan imaging in hospitals in order to separate them and give the right treatment.



Hard Facts about stroke

- Worldwide, 15 million people suffer of stroke every year;
- Five million people die;
- Five million people are permanently disabled;
- In Europe the total cost for stroke in 2010 has been estimated at €64bn;
- Stroke below 65 years of age is increasing and are today 20% of the victims;
- Close to 85% of all strokes are ischemic (blood clot), the rest are haemorrhagic (bleeding).

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Great efforts have been made to urge people to be vigilant for signs of a stroke, but even if the alarm comes earlier, today there is only a 3-7% chance they will get the treatment they need in time. By enabling both diagnosis and treatment in the ambulance, the proportion receiving the right treatment – and thus not suffering permanent disability – could multiply.

It is clear why time is absolutely of the essence when you consider that two million brain cells die every minute at the beginning of a stroke. Some 85% of all stroke cases are due to a blood clot – and would be helped by thrombolysis. Applying tools for early diagnosis and treatment can, in some cases, save hours, during which the patient otherwise would be more or less untreated.

Strokefinder

Swedish medical technology company Medfield Diagnostics has successfully developed new technology that has led to the establishment of a revolutionary method for diagnosing a stroke. The solution, simply called ‘Strokefinder’, enables professionals to determine diagnosis earlier. In fact, the answer to the blood clot



question can be obtained on the way to the hospital, with access to the right diagnostic tools in the ambulance.

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So in a close collaboration between biomedical engineering, signal processing and medical scientists in Göteborg, Sweden, a project dealing with microwave propagation in human tissues has developed a system for screening patients for the presence, location and size of intracranial bleedings. The ambition has been to create a device that could be used upon arrival in the emergency room, or by ambulance personnel at the scene of an incident.

The Strokefinder system, developed by Medfield Diagnostics, consists of an array of antennas, placed inside a cap and connected to an instrument that generates, detects and analyses microwave signals which are sequentially transmitted from each antenna and detected through the others. Advanced signal processing is applied in order to detect patterns in the scattering of the microwave signal, caused by changes in the brain.

The relative simplicity and size of a microwave-based diagnostic system underlines the possibility of creating an ambulance-based pre-hospital diagnostic system for stroke patients. A microwave-based system further has the advantage of being completely safe and without side effects since the power levels used are only a fraction of what is transmitted by a mobile phone. The method also has the potential of becoming quite cost-effective as the component costs are driven down by the considerably larger telecom industry.

In collaborating with healthcare providers, the Medfield Diagnostics Strokefinder quantifies its benefit. Clinical trials have been performed, others are on-going. In working with medical professionals, the Strokefinder gives the best chance of saving those struck down by stroke.



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