Method for risk prediction of death or vasospasm after subarachnoid haemorrhage

A research group of the Andalusian Public Health System, in collaboration with the Centro Nacional de Aceleradores, has developed a method and system that allows predicting the probability of death or of suffering vasospasm of a patient from a Computerized Tomography image (CT) of neurocritical patients.

>> Oficina de
TRANSFERENCIA DE TECNOLOGÍA
Sistema Sanitario Público de Andalucía

CNA

Description

Subarachnoid hemorrhage (SAH) has an estimated incidence of 4-28/ 100,000 inhabitants and is the most common cause of sudden death by stroke. It represents an approximate mortality of 20-40% of the patients admitted to the hospital, plus 8-15% mortality in the first minutes or hours, in the prehospital stage. The high morbidity and mortality of SHA is largely due to the complications that may occur after initial bleeding such as cerebral vasospasm, which is responsible for neurological deterioration and even death in 15-20% of patients. The The detection of the onset of cerebral vasospasm is via continuous clinical examination of the patient, sonographic records of the cerebral arteries or even through cerebral arteriography.

On the other hand, one of the tools that allows to estimate the severity of patients with involvement of the central nervous system, as it happens after SAH, is the volume of the lesion in simple cranial computerized axial tomography (CT). Accuracy is very dependent on the quality of the CT scan and the ability of the medical professional to interpret it. In addition, current scales including the volume of the lesion to make prognostic are used. However, this is a subjective information, given that despite advances in image viewers, estimates of lesional volume remain to be rough and with a high inter-observer variability.

The present technology is based on a set of objective parameters obtained from an image of cranial CT, which allows to estimate the risk presented by each patient to undergo vasospasm or even to die by measuring in a standardized, objective and precise manner the amount and size of the image of blood or injured area. This method may be carried out in whole or in part automatically by a processing means.

Advantages

1. Real risk stratification enabling to: (i) Identify intracranial lesions; (ii) Estimate volume of bleeding/ brain injury of spontaneous or traumatic origin; (iii) Estimate affected areas and possible secondary functional repercussions; (iv) Estimate the objective prognosis of the neurocritical patient of suffering vasospasm or intra-hospital death.
2. Automated and immediate image processing independent of the observer through internet application http://sahcna.us.es or via plug-in in TAC system to be developed.
3. Does not need manual detection of injuries reducing errors due to lack of attention or knowledge.
4. Prevents the occurrence of disabling sequelae, as well as safeguard the life of patients and improves hospital resources efficiency both because patient location and effective treatment after SAH.

Intellectual property

Protected by a Spanish Patent application with the possibility of international extension.

Objectives

License agreement for collaboration and/or exploitation.

Classification

Area: Medical device/ Diagnostics / ICT
Pathology: Critical care; subarachnoid haemorrhage, emergencies; neurology.

Hospital Universitario Virgen del Rocío. Edificio de Laboratorios, 6ª Planta. Avda. Manuel Siurot, s/n 41013 Sevilla. ESPAÑA ☎+34 955 013 647 MÓVIL: +34 671 597 574
✆ pablo.hervas.exts@juntadeandalucia.es

JUNTA DE ANDALUCÍA
CONSEJERÍA DE IGUALDAD, SALUD Y POLÍTICAS SOCIALES

IBiS
INSTITUTO DE BIOMEDICINA DE SEVILLA

FISEVI
Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla