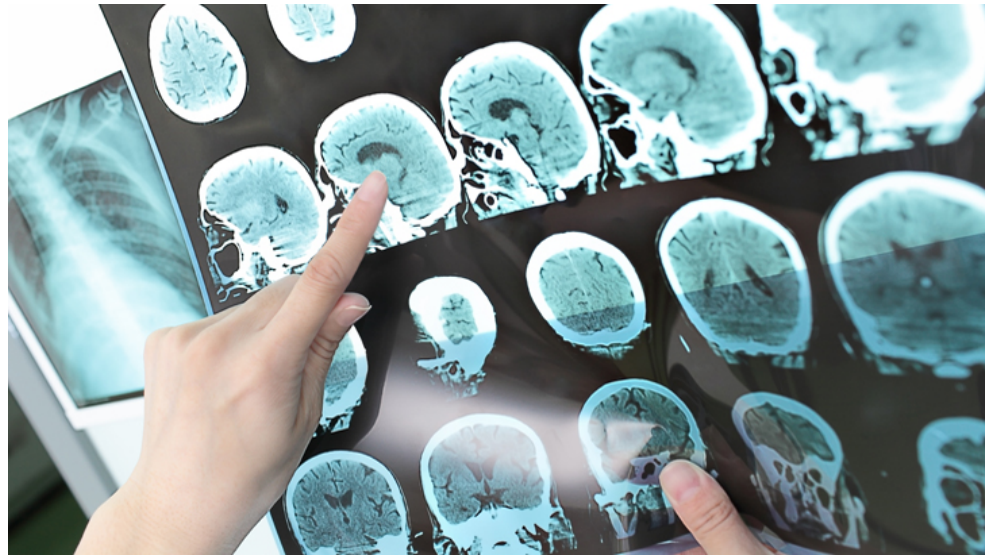


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Stroke: searching for biomarkers to predict evolution



Stroke is the first cause of serious physical and intellectual disability and dependence, and the second cause of death in Spain, according to data from the Spanish Stroke Observatory (SESC). The observatory estimates that in the next decades this health problem will have a significant demographic, public health and social impact. Researchers from the Vall d'Hebron Institute (VHIR), affiliated to the UAB, reviewed the scientific literature in search of biomarkers which would allow to predict the disease's prognostic and evolution. Some of these molecules, called DAMPs, could be of great interest in the near future.

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Stroke consists of the sudden functional impairment of a determined brain area, due to a vascular cause: either to the interruption of cerebral blood flow (ischemic stroke or cerebral infarction), or to the rupture of a blood vessel (hemorrhagic stroke or brain hemorrhage). Both entities lead to cell death within the impaired brain area.

Stroke represents one of the main causes of mortality and disability worldwide: Several months after the event, survivors remained with sequelae, leading to patient's disability in almost a half of the cases. There are biomarkers in practice that could be used to predict the evolution of each stroke patient. In other diseases, the use of biomarkers is usual for this indication, such as the case of troponin in the management of acute myocardial infarction.

biomarkers are molecules acting as indicators of a pathophysiological process in relation with the disease easily measured.



At stroke onset, inflammatory mechanisms are started. Those mechanisms, under normal conditions, are responsible for the entrance of defense cells or leukocytes in the affected area. Their role consists of cleaning up debris derived from cell death, therefore contributing to restore the normal situation in close areas. For this purpose, the permeability of the blood-brain-barrier (BBB), responsible for the regulation of the traffic of molecules between the bloodstream and the brain, should be increased. However, this inflammatory reaction also has deleterious effects, which are particularly important in severe strokes. The increased BBB permeability might result in local complications, such as cerebral edema, hemorrhagic transformations within the infarct. Both complications could be severe and life-threatening. In the peripheral circulation, the abnormal inflammatory response might also condition complications such as myocardial infarction and cardiac disorders.

The molecules that are released to the bloodstream during this inflammatory reaction represent a unique opportunity for the study of blood biomarkers in relation with stroke. In the present article, we conducted a review directed to three different categories of molecules involved in the inflammatory response after stroke: damage-associated molecular patterns (DAMPs), cytokines and C-reactive protein (CRP). From a general perspective, we

associations for the most studied biomarkers (CRP and interleukin-6, essentially). Although its raised associated with poor outcome after stroke, its additional predictive value over clinical information is just absent. This fact is of special importance, as clinical information is easily obtained at patient's bedside.

Regarding post-stroke complications, we found very few studies evaluating the association of blood bio complications. From a practical point of view, prediction of post stroke complications could be interes the anticipation of these events and the initiation of therapeutic measures directed against then biomarker's research should be more focus on post-stroke complications prediction or early diagnosis rather than prediction of stroke outcome.

Finally, as we expected as being new candidates, DAMPs have been not widely studied in relation wit However, given its important as triggers of the inflammatory response, we think that measurement receptors could be of great interest in the near future.

Alejandro Bustamante

Vall d'Hebron Research Institute
Neurology Department, Vall d'Hebron University Hospital
Universitat Autònoma de Barcelona
alejandro.bustamante@vhir.org

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