Hyperacute detection of neurofilament heavy chain in serum following stroke: a transient sign.

Abstract:
Serological biomarkers which enable quick and reliable diagnosis or measurement of the extent of irreversible brain injury early in the course of stroke are eagerly awaited. Neurofilaments (Nf) are a group of proteins integrated into the scaffolding of the neuronal and axonal cytoskeleton and an established biomarker of neuro-axonal damage. The Nf heavy chain (NfH(SMI35)) was assessed together with brain-specific astroglial proteins GFAP and S100B in hyperacute stroke (6 and 24 h from symptom onset) and daily for up to 6 days. Twenty-two patients with suspected stroke (median NIHSS 8) were recruited in a prospective observational study. Evidence for an ischaemic or haemorrhagic lesion on neuroimaging was found in 18 (ischaemia n = 16, intracerebral haemorrhage n = 2). Serum NfH(SMI35) levels became detectable within 24 h post-stroke (P < 0.0001) and elevated levels persisted over the study course. While GFAP was not detectable during the entire course, S100B levels peaked at the end of the observation period. The data indicate that significant in vivo information on the pathophysiology of stroke may be obtained by the determination of NfH(SMI35). Further studies are required to evaluate whether NfH(SMI35) in hyperacute stroke reflects the extent of focal ischaemic injury seen on neuroimaging or is a consequence of more diffuse neuro-axonal damage.