

Streszczenie w języku angielskim.

Brain–Kidney Cross-Talk: The Role of Renal Function in Prognosis After Spontaneous Intracerebral Hemorrhage.

Intracerebral hemorrhage (ICH) is associated with high mortality and a higher risk of permanent disability in adults compared with ischemic stroke. In treatment to ischemic stroke, options for causal treatment remain limited, and patient prognosis largely depends on systemic factors. In recent years, increasing attention has been paid to the role of renal function in the course of acute brain diseases, including ICH. Interactions between the brain and the kidneys, referred to as the brain–kidney axis, may affect both the clinical course and treatment outcomes through disturbances in hemodynamics, oxidative stress, and activation of inflammatory responses.

The aim of the series of three publications was to investigate the significance of renal function for the clinical course and prognosis of patients with spontaneous ICH, with particular emphasis on the role of reduced estimated glomerular filtration rate (eGFR) at admission and the occurrence of acute kidney injury (AKI) during hospitalization.

In the first study (**“Acute kidney injury in patients with spontaneous intracerebral hemorrhage – Is it a real problem?”**, *Neurol Neurochir Pol.*, 2025), AKI was shown to occur in 13.5% of patients with spontaneous ICH and to constitute an independent predictor of poor outcome, more than doubling mortality and contributing to worse outcomes on the Modified Rankin Scale (mRS) at 90 days after stroke onset. The strongest predictors of AKI were more severe neurological status at admission, concomitant infections, use of nephrotoxic antibiotics, and hemodynamic disturbances.

In the second study (**“Admission eGFR as a Marker of Systemic Vulnerability in Patients with Spontaneous Intracerebral Hemorrhage”**, *Journal of Clinical Medicine*, 2026), the significance of reduced admission eGFR as a marker of systemic vulnerability was assessed. Patients with eGFR <60 mL/min/1.73 m² were characterized by a more severe disease course as assessed by the National Institutes of Health Stroke Scale (NIHSS), larger hematoma volume, more frequent occurrence of AKI, and worse 90-day functional outcomes. After adjustment for age and prestroke disability, eGFR lost its independent prognostic value, indicating that it reflects overall systemic vulnerability and limited physiological reserve rather than isolated renal dysfunction.

The third publication (**“Acute kidney injury in the course of intracerebral hemorrhage: epidemiology, pathophysiological mechanisms, and risk factors”**, *Pol Przegl Neurol* 2026) was a narrative review summarizing current knowledge on the pathophysiological mechanisms linking AKI with the course of ICH. It discussed, among other factors, activation of the sympathetic–adrenal system, disturbances in renal autoregulation, hypoperfusion, oxidative stress, and the potential impact of medications.

Taken together, the entire series of studies confirms that renal dysfunction is a frequent and clinically relevant phenomenon in the course of ICH, and that its presence serves as a marker of systemic susceptibility to hemodynamic and metabolic stress. Reduced eGFR and the development of AKI represent elements of the same pathophysiological cascade, closely associated with stroke severity and prognosis.

The obtained results are of both scientific and practical importance. They indicate the need for early identification of high-risk patients, routine monitoring of renal function, cautious use of nephrotoxic medications, and individualization of antihypertensive therapy and fluid management. The findings of this series may also provide a starting point for further research into the role of renal parameters as biomarkers of systemic vascular vulnerability and prognosis in acute brain diseases.

