

## REVIEW ARTICLES

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### The importance of matrix metalloproteinases in the prognosis of acute ischemic stroke patients

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#### Abstract

**Background:** Ischemic stroke is one of the leading causes of mortality and disability worldwide. Numerous studies were performed to assess the risk of clinical deterioration of acute ischemic stroke patients, including the risk of haemorrhagic transformation. The complexity of cerebral ischemia pathology raised the possibility of a multitude of candidate-molecules to be studied as stroke biomarkers. The blood brain barrier integrity biomarkers have shown promising results both in fundamental and clinical studies. Matrix metalloproteinases have been extensively analysed and gave encouraging results for predicting unfavourable neurological outcome, including the risk for haemorrhagic transformation. Matrix metalloproteinase-9 plays a crucial role in the disruption of the blood-brain barrier following focal cerebral ischemic stroke. Elevated matrix metalloproteinase-2 levels are responsible for the degradation of tight junction proteins, basal lamina and neuronal injury after ischemia, and may contribute to infarction and hemorrhagic volume. The review provides an overview of matrix metalloproteinases' role in the prognosis of acute ischemic stroke patients, regarding the stroke outcome and the risk of haemorrhagic transformation.

**Conclusions:** Matrix metalloproteinases, especially gelatinases, are extensively studied for their predictive value in ischemic stroke evolution. Matrix metalloproteinase-2 and matrix metalloproteinase-9 correlate with stroke severity and haemorrhagic transformation in acute ischemic stroke, but large validation studies are needed for practical translation. Future studies should focus on developing a biomarker panel for predicting outcomes in stroke patients.

**Key words:** cerebrovascular accident, matrix metalloproteinases, stroke outcome.

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