

# New Risk Factors in Poststroke Epilepsy

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i Hjärtats aula, Vita Stråket 12, Sahlgrenska Universitetssjukhuset, Göteborg, fredagen den 3 juni 2022, klockan 09.00.

av Hanna Eriksson, leg. läkare

Fakultetsopponent:

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## Avhandlingen baseras på följande delarbeten

- I. Eriksson H, Wirdefeldt K, Åsberg S, Zelano J. Family history increases the risk of late seizures after stroke. *Neurology*. Nov 2019, 93:(21) e1964-e1970. PMID:31645466 DOI: 10.1212/WNL.0000000000008522
- II. Eriksson H, Löwhagen Hendén P, Rentzos A, Pujol- Calderón F, Karlsson J-E, Höglund K, Blennow K, Zetterberg H, Rosengren L, Zelano J. Acute symptomatic seizures and epilepsy after mechanical thrombectomy. *Epilepsy Behav*. 2020 Mar;104(PtB):106520. PMID:31526644 DOI: 10.1016/j.yebeh.2019.106520
- III. Eriksson H, Kumar Banote R, Larsson D, Blennow K, Zetterberg H, Zelano J. Brain injury markers in new-onset seizures in adults: A pilot study. *Seizure*. 2021 Nov;92:62-67. PMID:34455195 DOI: 10.1016/j.seizure.2021.08.012
- IV. Eriksson H, Nordanstig A, Rentzos A, Zelano J, Redfors P. The risk of poststroke epilepsy after endovascular treatment: a national cohort study. *Manuscript 2022*.

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# New Risk Factors in Poststroke Epilepsy

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## Abstract

The overall aim of the present research was to identify new risk factors for poststroke epilepsy (PSE). Specifically, to assess the impact of having a first-degree relative with epilepsy on PSE risk (Paper I), and to investigate if endovascular treatment (EVT) affects PSE risk and possible factors that modify PSE risk in EVT (Paper II and IV). Additionally, we explored if blood-brain injury markers can assess stroke severity and assist in predicting PSE or in identifying individuals of high risk of epilepsy (Paper II and III).

Family history influences the risk of epilepsy in young persons, but such association in adults is less clear. We assessed the effect of having a first-degree relative with epilepsy on PSE risk in a nationwide register study. We found that family history increased the PSE risk.

EVT is a new treatment, and the literature on the risk of subsequent PSE conflicting. EVT is indicated in large vessel occlusion, in itself, a substantial risk factor for PSE. We first assessed PSE risk after EVT in a local cohort at the Sahlgrenska University Hospital. The included individuals had severe stroke, but despite this, the incidence of PSE after EVT was only 4.4%. Blood concentrations of biochemical brain injury markers were generally higher in individuals with PSE.

PSE risk after EVT was subsequently studied in a nationwide register study comparing EVT to other acute stroke treatments matched for pre-treatment stroke severity. EVT was associated with a lower risk of PSE compared to treatment with intravenous thrombolysis (IVT) or no acute treatment. IVT in addition to EVT and no radiological infarction on day one was associated with a reduced PSE risk.

To elaborate on the biochemical results from paper II, we conducted an exploratory local cohort study of individuals with first-ever seizures. The PSE group had increased Neurofilament light (NfL) compared to individuals with single seizures.

In summary, having a positive family history increased the PSE risk, and EVT was associated with a decreased PSE risk in cases of severe stroke. Whether biochemical brain injury markers can aid in prediction and diagnosis of PSE requires further study.

**Keywords:** Poststroke epilepsy, Epilepsy, Seizures, Stroke, Endovascular treatment, Biomarkers

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