

Acquired epilepsy in multiple sclerosis

A nationwide register-based investigation into prognosis and treatment

Akademisk avhandling

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av Zamzam Mahamud

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Universitetet i Tromsø, Norge

Avhandlingen baseras på följande delarbeten

- I. **Mahamud Z**, Burman J, Zelano J. Risk of epilepsy after a single seizure in multiple sclerosis.
European journal of neurology 2018;25:854-860.
- II. **Mahamud Z**, Burman J, Zelano J. Prognostic impact of epilepsy in multiple sclerosis.
Mult Scler Relat Disord 2020;38:101497.
- III. **Mahamud Z**, Håkansson S, Burman J, Zelano J. Retention of antiseizure medications for epilepsy in multiple sclerosis: A retrospective observational study.
Epilepsy Behav 2021;121:108034.
- IV. **Mahamud Z**, Burman J, Zelano J. Temporal trends of epilepsy in multiple sclerosis.
Acta neurologica Scandinavica 2022.

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A nationwide register-based investigation into prognosis and treatment

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Abstract

The prevalence of epilepsy in persons with multiple sclerosis (MS) is thrice that of the general population. The association between epilepsy and MS prognosis and its management are however largely unknown. The prevalence of concomitant MS and epilepsy is low, making recruitment of sufficient numbers of patients for single-centre studies difficult. To circumvent this, we cross-referenced the Swedish MS register (SMSreg), which covers at least 80% of prevalent MS cases, with a series of other national registers, making a cohort of up to 370 MS patients with epilepsy available for our studies. This thesis addresses clinically pertinent questions on diagnosis, prognostic impact and treatment of epilepsy in MS.

In a first-ever evaluation, we found the 10-year risk of epilepsy following a first unprovoked seizure in MS to be 51.4% (95% CI 44 – 58.9%). Hence, a single seizure in MS is not sufficient for epilepsy diagnosis as it does not exceed the diagnostic threshold (60%) (Paper I). In assessing the prognostic impact of epilepsy, we found epilepsy to be associated with at least fourfold increased mortality, although seizure-related deaths were rare. Epilepsy was not associated with an increased risk of conversion to secondary progressive MS (Paper II). Regarding treatment of epilepsy in MS, we discovered carbamazepine to be the most prescribed antiseizure medication at treatment initiation, although retention tended to be higher with lamotrigine (Paper III). Lastly, we tested the hypothesis whether the introduction of disease modifying treatments for MS has affected the incidence of epilepsy in MS. We could not confirm this, but instead found a steady increase in epilepsy prevalence between 1991 – 2018 (Paper IV).

In conclusion, we confirm a negative prognostic association between epilepsy and MS and offer novel insights into diagnosis and treatment of epilepsy in MS. We also demonstrate the feasibility and necessity of using a register-based approach to study a relatively rare form of acquired epilepsy.

Keywords: Multiple sclerosis, epilepsy, seizure, diagnosis, mortality, antiseizure medication, prevalence, incidence

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