Department of Clinical Neuroscience

EPIDEMIOLOGICAL STUDIES OF EPILEPSY: INCIDENCE AND RISK FACTORS

AKADEMISK AVHANDLING

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ABSTRACT

Epilepsy is one of the most common serious neurological disorders leading to significant consequences for the affected. Despite the wealth of epidemiological data, there are still many un-answered questions. The major challenges in epidemiological research relate to the fact that epilepsy is a heterogeneous condition which hampers the evaluation of subgroups of e.g. different seizure/epilepsy types and age groups.

The overall objective of the present research was to describe the incidence and some selected risk factors for unprovoked seizures/epilepsy in a large representative population based cohort. Four studies were carried out, using the Stockholm Incidence Registry of Epilepsy (SIRE), a large cohort of incident cases with unprovoked seizures and epilepsy. We first analysed the age- and sex-specific incidence of unprovoked seizures/epilepsy in Stockholm, Sweden. The age-adjusted incidence for unprovoked seizures/epilepsy was 40.4 for males, and 30.7 for females, and in the lower range of the incidence rates reported from Europe and the US. Although our incidence rates suggest a possible under-ascertainment in particular among the elderly, the distribution of cases by gender, seizure type and aetiology indicate that there is no major selection bias.

We then performed three separate case-control studies with cases from SIRE, the controls taken from the Population and Housing Census, and exposure defined as a hospital discharge diagnosis using ICD codes from the Swedish Hospital Discharge Registry. Case-control data were linked to the hospital discharge registry to identify a history of in-hospital care for the diagnoses chosen, from 1980 up to the year of the index seizure and also after the index seizure. When analysing the risk of developing unprovoked seizures/epilepsy after hospitalization for stroke, diabetes and myocardial infarction, we could confirm, previously known increased risks of developing unprovoked seizures after intracerebral haemorrhage, odds ratio (OR) 7.2 (95% confidence interval (CI) 3.9-13.6) and cerebral infarction, OR 9.4 (95% CI 6.7-13.1), and a less pronounced risk increase after hospitalization for acute myocardial infarction, OR 1.7 (95% CI 1.4-2.8). The risk of developing unprovoked seizures/epilepsy was substantial even more than 7 years after the stroke.

Socioeconomic belonging was also studied as a potential risk factor for development of unprovoked seizures/epilepsy, and we did not find an association between socioeconomic class and risk of unprovoked seizures. Psychiatric disorders as risk factors for seizures/epilepsy was analysed, and increased rates were observed both predating, (OR 2.5 (95% CI 1.7-3.7) for depression, OR 2.7 (95% CI 1.4-5.3) for bipolar disorder, OR 2.3 (95%CI 1.5-3.5) for psychosis, and OR 2.6 (95% CI 1.7-4.1) for suicide attempt), as well as succeeding seizure onset.

We further analysed the risk, (OR, 95%CI), of developing unprovoked seizures/epilepsy after hospitalization for multiple sclerosis (MS), systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA). The risk of unprovoked seizures was increased in patients with a hospital discharge diagnosis of MS, OR 3.5 (95% CI 1.5-8.1) and even more so for patients with SLE, OR 8.0 (95% CI 2.2-30.0), whereas RA was not associated with an increased risk, OR 1.2 (95% CI 0.5-2.9). We also found a comparatively high age and advanced disability at seizure onset as well as a long lag time from diagnosis of MS and SLE until seizure onset.

Keywords: seizure, epilepsy, incidence, risk factor, case-control, stroke, psychiatric disorder, multiple sclerosis

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