

# Type 1 diabetes linked to 3-fold increase in risk of epilepsy

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People with type 1 diabetes have a three-times increased risk of developing epilepsy later in life, concludes research published in *Diabetologia*, the journal of the European Association for the Study of Diabetes (EASD).

Type 1 [diabetes mellitus](#) is one of the most common autoimmune disorders in children, with a 3% annual increase in the global incidence rate since the 1980s. In recent decades, the incidence of type 1 [diabetes](#) has increased in children and adolescents, particularly those aged younger than 5 years. Patients with diabetes are at [increased risk](#) of severe health problems and mortality. Recent studies have found that type 1 diabetes could be a

risk factor for the development of epilepsy in children, though the exact underlying mechanisms remain unknown. In this new study, Dr I-Ching Chou, China Medical University Children's Hospital, Taichung, Taiwan, and colleagues evaluated the relationship between type 1 diabetes and epilepsy in Taiwan.

Data from the Taiwan National Health Insurance Research Database were used to conduct retrospective analyses. The study cohort contained 2,568 patients with type 1 diabetes, each of whom was frequency-matched by sex, urbanisation of residence area and index year with ten control patients without type 1 diabetes. Computer modelling was used to estimate the effects of type 1 diabetes on epilepsy risk. In patients with type 1 diabetes, the risk of developing epilepsy was significantly

higher than that in patients without type 1 diabetes. After adjustment for potential confounders, the type 1 diabetes cohort was 2.84 times more likely to develop epilepsy than the control cohort.

The authors say: "This result is consistent with those of previous studies in that epilepsy or seizures are observed in many autoimmune or inflammatory disorders and are linked to the primary disease, or secondary to pro-inflammatory processes."

Immune abnormalities, brain lesions, genetic factors and metabolic abnormalities are all potential causes for the link between type 1 diabetes and epilepsy. They say: "In particular, both hyperglycaemia and hypoglycaemia commonly occur in elderly people with diabetes., and can alter the balance between the inhibition and excitation of neuronal networks and cause focal motor seizures. In addition, we found that younger age was associated with an increased risk of developing epilepsy. Previous studies have suggested severe hypoglycaemia, young age and early onset as critical risk factors for brain abnormalities... The current results could provide evidence to facilitate the prognosis of children with type 1 diabetes."

They conclude: "Patients with type 1 diabetes are at an increased risk of developing epilepsy. Metabolic abnormalities of type 1 diabetes, such as hyperglycaemia and hypoglycaemia, may have a damaging effect on the central nervous system and be associated with significant long-term neurological consequences. The causative factors between type 1 diabetes and the increased risk of [epilepsy](#) require further investigation."

**More information:** I-Ching Chou et al. Risk of epilepsy in type 1 diabetes mellitus: a population-based cohort study, *Diabetologia* (2016). [DOI: 10.1007/s00125-016-3929-0](https://doi.org/10.1007/s00125-016-3929-0)

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