NEUROENDOCRINOLOGY

Prevalence of thyrotoxicosis-related seizures

Evidence for a relationship between the thyroid gland and dysfunction of the central nervous system first appeared over 40 years ago, when researchers showed that administration of thyroxine in animal models of epilepsy reduces seizure threshold, whereas surgical removal of the thyroid gland protects against pharmacologically induced seizures in these animals.

Patients with thyrotoxicosis can exhibit perturbations of the central nervous system that manifest as anxiety, irritability, distractability and occasionally short-term memory loss. In addition, several case reports have suggested an association between thyrotoxicosis and seizures, as correction of thyrotoxicosis leads to resolution of seizures whereas disease recurrence causes relapse.

Song *et al.* retrospectively determined the prevalence and clinical features of seizures in 3,382 patients with hyperthyroidism to assess the prevalence of seizures caused by the thyrotoxic state.

After exclusion of patients with seizures and a history of epilepsy, sepsis or meningitis, seven patients (0.2%) were found to have acute seizures with no obvious cause except for thyrotoxicosis (average age 39.6 years; range 11–66 years). Two of these patients, in whom an abnormal MRI was determined later, were not excluded as their seizures resolved after euthyroidism was achieved.

Four patients (57%) exhibited primary generalized tonic-clonic seizures, whereas complex partial seizures with secondary generalized tonic-clonic seizures occurred in two patients (29%), and one patient had a focal seizure (14%). An initial electroencephalography (EEG) was normal in two patients (29%), showed generalized slow activity in four patients (57%) and diffuse generalized β activity in one patient (14%).

After treatment of thyrotoxicosis, the five patients who initially had abnormal EEG patterns were euthyroid, and a repeated EEG was normal in all of these patients. None of the patients had recurrent seizures during follow-up (18–24 months).

The investigators conclude that hyperthyroidism is the precipitating cause of seizures in a small percentage of patients and that the prognosis of thyrotoxicosis-associated seizures is good if thyroid dysfunction is successfully treated.

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Original article Song, T. J. *et al.* The prevalence of thyrotoxicosis-related seizures. *Thyroid* **20**, 955–958 (2010)