Thyroid Hashimoto's encephalopathy

Thyroid disease is associated with several neurological disorders,

Hashimoto's encephalopathy. This was originally postulated to be a distinct disease entity by Brain et al in 1966 and there have subsequently been case reports substantiating the hypothesis that it represents a unique condition. The characteristic features are a subacute onset of confusion with altered mental status, seizures, and events that respond to steroids and which occur in the context of high anti-microsomal antibody titres. To date all the patients reported have been either euthyroid or hypothyroid at the time of presentation. We present here a case of Hashimoto's encephalopathy with pronounced thyrotoxicosis, that was successfully managed with steroids, carbimazole, and propranolol.

A 49 year old woman presented with a six month history of weight loss and a three month history of proximal arm pain and hand tremor. Two weeks before admission she developed a progressive left sided weakness involving the arm and leg in conjunction with a left hemianesthesia. On examination at admission she was flushed, feverish, and had hypothermia. Her cardiovascular system was not narrowed as in propranolol and had florid visual hallucinations, while independently having runs of paroxysmal atrial fibrillation. As a result of the original negative findings (see later) dexamethasone (12 mg/day) and acyclovir were started with the presumptive diagnosis of an encephalitis or vasculitis. On this regime she made a dramatic improvement, which was further enhanced by the treatment of her thyrotoxicosis on receipt of her thyroid function tests.

The introduction of carbimazole and propranolol was then followed by a reduction in the dexamethasone to 4 mg/day and cessation of acyclovir. Attempted steroid weaning over subsequent days provoked a recurrence of her focal symptoms on two occasions, with weakness of her right arm. Eventually the patient was stabilised on prednisolone (40 mg/day) and discharged on a slowly reducing course with no relapses three months after discharge.


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4 Tippin J, Adams HP, Smoker WRK. Early CT and MRI did not show residual neurological or psychiatric abnormalities. The patient's IQ was 126-130.

5 Sein M, Apter A, Dickerman Z, Tyano S. Autoimmune thyroid disease is characterised by the presence of thyroid antigens and antibodies and has rarely been associated with an encephalopathic process of unknown aetiology. All previously described patients have either been euthyroid or hypothyroid and this is the first description of an encephalopathy in combination with thyrotoxicosis. As the mechanism of encephalopathy is uncertain the term thyroid related encephalopathy is preferable. Although atrial fibrillation was present in our patient, the normal heart and head imaging argue against an embolic cause for her condition. Furthermore, her remarkable steroid responsiveness suggests an autoimmune cause for her fluctuating multifocal encephalopathy.

Various mechanisms have been postulated to account for this unusual condition. One possibility is demyelination, which can virtually be discounted on the basis of our results as both MRI and CSF were normal. More likely explanations are either a multifocal abnormality of cerebral perfusion or a patchy defect of cerebral blood flow.

This patient completes the repertoire of thyroid states seen in thyroid related encephalopathies and emphasises the need to assess thyroid function and autoantibody status in patients presenting with encephalopathy and stroke-like events in the absence of structural or infectious aetiologies.

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Cerebral salt wasting syndrome

Excessive natriuresis, resulting in hypotension, is often recognised complication after subarachnoid haemorrhage. Initially this was attributed to inappropriately diuretic urine in the setting of hypovolaemia, but

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recently it has become clear that hyponatremia in the cerebral salt wasting syndrome is accompanied by hypovolemia.\(^1\) We report a patient with cerebral salt wasting after aneurysmal subarachnoid haemorrhage who showed remarkable changes in urine production during surgery. A 46 year old woman was admitted with severe headache and vomiting. Physical examination was unremarkable. Brain CT showed a subarachnoid haemorrhage with blood in the suprasellar cisterns and the left Sylvian fissure. Two days later she developed a pronounced diuresis 24 hours after intracranial pressure monitoring. Sodium and fluid loss were fully compensated by 0.9% NaCl infusion. On day 9 she was found unconscious with respiratory failure and bradycardia and CT disclosed a recurrent subarachnoid haemorrhage in the left Sylvian fissure. Two days later she again developed a progressive polyuria of up to 21,200 ml per day (on day 22) and a 24 hour renal sodium loss of 2630 mmol. The plasma sodium range was between 128 and 132 mmol/l, and the colloidal osmotic pressure was between 18.7 and 24.0 mm Hg. Serum ADH concentrations were normal. Treatment with fludrocortisone had no effect on renal sodium loss. Despite the high plasma atrial natriuretic protein concentrations were within the normal range (up to 11-1 pmol/l, normal 3-23 pmol/l); atrial natriuretic protein in CSF was not assessed. Daily transcranial Doppler sonography was indicative of cerebral vasospasm and therefore angiography was performed on day 10 showing that the left middle cerebral artery was disclosed, which was successfully clipped on day 24. Whereas the diuresis 24 hours before and after the neurosurgical procedure was 600-700 ml/hour, the mean intraoperative (from incision to the last suture) production of urine was 150 ml/hour. The largest reduction in diuresis was seen while the dura was open. Soon after suturing the dura, urine production rose to preoperative values. Two days after surgery diuresis decreased remarkably and was back to normal on the fourth day after operation. Repeat measurements of plasma sodium were also normal. The patient had fully recovered two months after the operation. Our patient had a very pronounced urinary sodium loss of up to 60 g per day. Opening of the dura resulted in a decrease in diuresis of 77.5%. Both a reactive increase of CSF production and a decrease in the intracranial pressure may have been important. Because an increase of atrial natriuretic protein in CSF (and maybe other humoral factors) results in a decrease in CSF production,\(^2\) an increase in CSF production after loss of CSF through the open dura may have induced a decrease of atrial natriuretic protein, resulting in a decrease in natriuresis. In patients with subarachnoid haemorrhage Döcí and Bodosi found a linear correlation between plasma atrial natriuretic protein and atrial natriuretic protein concentrations in CSF.\(^3\) So lowering the intracranial pressure might result in reduced concentrations of atrial natriuretic protein in CSF and lead to an increase in CSF production and a decrease in natriuresis. If either assumption is correct, continuous CSF drainage—for example, by an external lumbar drain—may be an effective treatment for the cerebral salt wasting syndrome, especially in more severe cases.

A patient with cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) confirmed by sural nerve biopsy

"Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy" (CADASIL)\(^1\) is a newly defined syndrome characterised, in the absence of hypertension, by recurrent subcortical ischaemic strokes and by peculiar non-amyloid, non-arteriosclerotic angio­pathy of cerebral vessels. On MRI circumscribed subcortical ischaemic lesions and diffuse areas of leucoaraiosis are seen both in symptomatic and asymptomatic family members.\(^2\) Recently, genetic linkage analysis in two unrelated French families has assigned the disease locus to chromosome 19q12 with the most likely location of the disease gene between D19S221 and D19S222.\(^3\)

A few postmortem studies have been reported, showing predominant involvement of the cerebral white matter with diffuse myelin loss, multiple small deep infarcts, and occasional haemorrhages.\(^2\) As first reported by Baudrimont et al.,\(^4\) the small subcortical and leptomeningeal arteries and arterioles display fibrous thickening and an eosinophilic, perivascular PAS positive, granular material in the muscle layer. Electron microscopy shows swollen myocytes in the media surrounded by collagen, elastin, and a compact electron dense material.\(^5\) The arteriopathy of CADASIL is apparently not restricted to brain vessels as identical vascular lesions have been found in small myocardial arteries\(^5\) and sural nerve.\(^5\)

We present a 55 year old woman with a history of recurrent pulmonary embolism from the age of 55. At the age of 40 she experienced a feeling of heaviness in her left arm for about two days. Fifteen years later the patient described episodes of a burning sensation on her tongue and tinging as well as weakness of the left side of her face and her left arm. Six months later she complained of numbness and weakness of her left arm and leg, from which she recovered slowly. No risk factors such as arterial hypertension, diabetes, or migraine were reported. Neurological examination showed a slight left sided ataxia, hemiparesis, and hypophonia. The patient showed reduced cognitive performance and flexibility, a deficit in learning and memory, and abnormal visual constructional abilities which were compatible with a subcortical dementia. Brain MRI showed extensive hypodense cortical and subcortical areas, involving parieto-occipital, frontal, and temporal white matter on both sides, mainly in the periventricular and adja­cent subcortical regions (fig 1)."