LETTERS TO THE EDITOR

Acute Optic Neuritis in Australia: a 13 year prospective study

The frequency with which multiple sclerosis develops after an attack of acute optic neuritis varies widely in different series and has been reported to range from 11.5% to 86%. The variability in the findings may relate to different methods of patient selection, diagnostic criteria, geographical factors, duration of follow up, and study design.

A cohort of 82 patients (59 females, 23 males) with uncomplicated ON aged 10 to 50 years. There was a significant difference in the probability of developing multiple sclerosis in patients with single or recurrent attacks of optic neuritis or bilateral optic neuritis, in those who were DR-2 positive (table 1).

The finding in the Australian cohort that 52% of patients with optic neuritis were at risk of developing probable or clinically definite multiple sclerosis in 15 years. There was no significant difference in the probability of developing multiple sclerosis in patients with single or recurrent attacks of optic neuritis or bilateral optic neuritis, nor in those who were DR-2 positive (table 1).

Clinical features of patients with optic neuritis

| ON | ON-multiple sclerosis
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*Four subjects not typed.

Multiple sclerosis in 15 years is comparable with that of 57% in 11.6 years in the United Kingdom, 58% in the United States, and 45% in 15 years in Sweden.

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Post-traumatic hydrocephalus: influence of cranietomy on the CSF circulation

Post-traumatic ventricular dilatation may have a wide range of aetiological factors: starting from neuronal loss due to head trauma and possibly secondary ischaemic insults, to obstruction of CSF circulation resulting in hydrocephalus. It is important to differentiate between post-traumatic hydrocephalus and brain atrophy before considering placement of a shunt. Making this decision can be facilitated by measurement of the resistance to CSF outflow. However, the pattern of the CSF circulation may change dramatically after a cranietomy resulting from a previous decompressive cranietomy for refractory intracranial hypertension after head injury. The effect of the skull and dura on CSF hydrodynamics has been explored experimentally. The resistance to CSF outflow after cranietomy decreases twofold and brain compliance (expressed using the pressure-volume index, PVI) increases. This problem is important clinically as the following case illustrates:

A 44 year old man fell downstairs and was admitted with a Glasgow coma score (GCS) of 4. Brain CT disclosed an intracerebral haematoma, which required a right frontotemporal decompresive cranietomy to control raised intracranial pressure. Five months later he remained severely disabled with deteriorating GCS and increasing spasticity. Brain CT showed a progressive ventricular dilatation with widening of the cortical sulci. Cerebroplasty had been delayed because of persistent problems with infections.

The first lumbar computerised infusion test was performed 5 months after injury to study the patient's CSF circulation. The opening pressure was low (12.2 mm Hg) with a very low pulse amplitude. An infusion of normal saline at a rate of 1.5 ml/min increased the intracranial pressure (ICP) to a plateau of 20 mm Hg. The pulse amplitude was 2.4 mm Hg with a calculated resistance to CSF outflow of 7.5 ml/Hg. After 20 minutes an increase in the opening pressure to 12.2 mm Hg was observed.

A slow constant rate infusion tests global compliance of the cranial axis whereas a fast bolus volume load probably tests compartmental compliance of the container into which the extra volume is added. This pattern of CSF circulation with low or normal resistance to CSF outflow, increased brain compliance, and very few vasogenic waves is characteristic of cerebral atrophy. Cerebroplasty was carried out as his deterioration was attributed to the “syndrome of trephined” where the brain sinks in, particularly with erect posture and dehydration producing deterioration in conscious level and focal signs. However, 1 month later, there had been no progress in the patient's condition and repeat CT again suggested progressive ventriculomegaly. The infusion study was repeated. The opening ICP was now dramatically different (10 mm Hg) to the previous study. However, the pulse amplitude (1.5 mm Hg) was increased, and the calculated resistance to CSF outflow was greatly increased to 20 mm Hg/ml/min, with a calculated pressure-volume index of 15 ml. Such a pattern is specific for hydrocephalus. After this test the patient was shunted with a Codman Medos programmable valve (setting 120 mm H2O) ventriculoperitoneal shunt with remarkable clinical improvement, the GCS rose to 14, he began to talk and his spasticity in his arms decreased dramatically. It is obvious why the pressure-volume compensatory reserve (PVI) decreases after cranietomy, but the interpretation of an increase in the resistance to CSF is not immediately apparent. Two explanations are possible:

The patient had developed an acute hydrocephalus, possibly as a result of traumatic subarachnoid haemorrhage. Cranietomy was a factor allowing compensation of CSF circulation in the early stages. It is difficult to explain what is the nature of such compensation. Shapiro et al attempted to offer an interesting but conceptually difficult hypothesis that the time constant (resistance to CSF outflow x compliance of cerebrospinal space) of cerebrospinal system hydrodynamics has a tendency to remain constant. Therefore, a
mechanistic increase in compliance after craniectomy tends to be followed by a decrease in the resistance to CSF outflow. This process may be reversed after cranioplasty—that is, a decrease in PVI may be followed by an increase in the resistance to CSF outflow.

The second possible scenario is more important for clinical management. A large craniectomy may facilitate irreversible ventricular enlargement over weeks or months. Thus, after cranioplasty, the expanded ventricles may, via the cerebral mantle, obstruct the lumen of the cortical subarachnoid space and increase the resistance to CSF outflow.

This case demonstrates that when the CSF circulation is studied in patients with a large craniectomy the CSF outflow resistance cannot be taken reliably as a guide for shunting. Overnight ICP monitoring or CSF infusion study should be performed after cranioplasty, when CSF circulatory reserve decreases dramatically. Moreover, a prolonged period without a bone flap may encourage ventricular dilatation.

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CT and infusion studies. (A) Scan performed on admission. (B) After right frontal lobectomy and bone flap removal. (C) Four months after injury, before cranioplasty. (F) Infusion test demonstrated low resistance to CSF outflow and increased brain compliance. ICP=mean intracranial pressure; AMP=pulse amplitude of ICP waveform. Constant infusion rate of 1.5 ml/min is indicated by a thick horizontal line. X axis=time. (D) Five months after injury, after cranioplasty. (G) Infusion test demonstrated grossly increased resistance to CSF outflow and normal brain compliance. (E) One month after shunting: normalisation of ventricles. Bicaudate index decreased from 33% to 21% with a decrease in the 3rd ventricle diameter (from 13 mm to 8 mm).
Diencephalic amnesia and apraxia after left thalamic infarction

Amnesia and apraxia are unusual manifestations of unilateral thalamic lesions. A patient in whom severe amnesia and apraxia were the presenting features of a left thalamic infarct is presented. The findings support the concept that memory and praxis both utilise circuits which include the dominant thalamus.

A 78 year old right handed Hungarian woman presented with memory loss and disorientation. She had been well and conversed normally with her daughter on the evening before presentation. The next morning, her daughter was alarmed to find her mother’s house in a state of disarray. Dishes were unashed, lights left on, and doors open. The patient seemed baffled by eating utensils, attempting to scoop food with her knife. Later that morning, she failed to recognise longstanding Hungarian friends. She was unable to recall her address, the name of the city in which she lived, or the names of her grandchildren. She subsequently failed to recognise her family doctor of 7 years. History included non-insulin dependent diabetes, hypertension, hyperlipidaemia, and atrial fibrillation. Medications were digoxin, glibenclamide, and metoprolol. Captopril had been prescribed 4 weeks previously but was ceased 2 days before presentation due to presyncope symptoms. The patient consumed no alcohol. There was no history of cerebrovascular events.

Cognitive functions were examined at the bedside with the assistance of an interpreter, as the patient spoke no English, although she conversed freely in her native Hungarian. She had no recollection of events since emigrating to Australia 50 years previously, gave her correct maiden name, and could not recognise or name her grandchildren, although she recognised her daughter. She acknowledged that she was in a hospital, but maintained it was in Budapest and the year was 1947. Although her recollections regarding her early life and wartime Hungary seemed accurate, she confabulated when asked for details of recent events. Short term recall of verbal material and people was poor. The patient was able to name objects such as a pencil and a watch, and obey two and three stage commands. She wrote her name and copied simple designs correctly, and could imitate gestures such as waving goodbye or blowing a kiss. However, she was unable to use eating utensils or a toothbrush, either in pantomime or when provided with the object itself. Movements of the face and limbs were normal, and there were no sensory abnormalities. Knee and ankle jerks were absent bilaterally and both plantar responses were extensor. General examination revealed atrial fibrillation and mild cardiomegaly.

The patient continued to display severe impairment of anterograde memory. She was reluctant to leave her bed, and quickly became lost unless supervised. She did not recognise familiar staff members and was unable to use ward landmarks to reorientate herself. She required assistance to feed herself, brush her teeth, and shower. When reviewed 3 months later, her memory disturbance and apraxia for simple actions of daily life (such as brushing her teeth) persisted, necessitating care in a supervised environment.

Brain MRI (figure) showed a left anterior thalamic lesion consistent with lacunar infarction and periventricular white matter ischaemic changes. Deficits of anterograde and retrograde memory after thalamic lesions are well recognised. The syndrome of diencephalic amnesia after bilateral medial thalamic lesions typically involves striking disorientation for time, loss of autobiographical information (often extending back for many years), confabulation, and severe anterograde amnesia for verbal and visual material, with a condition of recognition of familiar faces. These features were well illustrated by our patient, who became “marooned” in an earlier place and time. Amnesia after unilateral thalamic lesions is rare. There is increasing evidence that thalamic lesions interrupt the multiple brain networks which form the anatomical substrate of memory, encompassing the hippocampus, medial temporal lobe, and cingulate cortices, and overlapping with the language areas of the left hemisphere. The thalamus is activated in retrieval of episodic (autobiographical) and semantic (encyclopaedic) information from long term storage and execution of learned motor tasks, which may reflect its widespread connections with other subcortical and cortical structures.

The patient’s ability to name or identify objects was not tested systematically on the evidence available, it seems likely that her difficulty in utilising common objects was a manifestation of apraxia for daily tasks rather than, for example, agnosia for the objects involved. Apraxia is a rare manifestation of isolated thalamic lesions. The ability to access stored motor representations is thought to be crucial for normal execution of learned actions. The motor representations involved are analogous to motor memories. Although praxis is generally regarded as a function of distributed cortical regions in the left hemisphere, apraxia in association with thalamic amnesia has not been emphasised in previous reviews of this syndrome. Involvement of deep hemispheric white matter in association with basal ganglia pathology is thought to be critical for the development of apraxia after lesions of subcortical structures. The conjunction of diencephalic amnesia and apraxia after thalamic infarction in the present case may be interpreted as further evidence that episodic, semantic, and motor memories is mediated by overlapping functional networks in the dominant hemisphere.
Transverse myelopathy in the antiphospholipid antibody syndrome: pinworm infestation as a trigger?

The antiphospholipid antibody syndrome is a disorder characterised by the production of autoantibodies directed against negatively charged membrane phospholipids. Antiphospholipid antibodies have been described in various neurological disorders. It has been generally accepted that viral, bacterial, and parasitic infections can serve as a trigger for autoimmune reactions. Despite the growing knowledge that has accumulated, the relation between parasites and autoimmunity has not been clarified.

Enterobius vermicularis (pinworm) is a nematode rarely found outside the gastrointestinal tract, but allergic reaction due to enterobiasis has been reported. We describe the case of transverse myelopathy preceded by intestinal pinworm infestation in the primary antiphospholipid antibody syndrome. To our knowledge, such an association has not been reported previously. Pinworm therapy was complicated by the Jarisch-Herxheimer reaction manifested by temporary exacerbation of pre-existing neurological symptoms.

In March 1998, a 40 year old woman who complained of perianal itching noticed the presence of worms migrating from the anus. Three days later itching and numbness intensified and the patient had weakness in the legs. These symptoms progressed over the next 3 days to severe paraparesis and urinary urgency. Her medical history was relevant for three unexplained miscarriages which all occurred in midpregnancies. In the local hospital, she underwent brain and lumbar-sacral spine MRI and findings were normal. Cerebrospinal fluid examination disclosed slightly raised proteins of 670 mg/l, 2 lymphocytes/mm³, oligoclonal immunoglobulin (Ig) G bands were absent. She was treated with methyldiprenisolone (1 g/day) intravenously for 3 days with subsequent gradual tapering off, which was associated with substantial improvement of motor, sensory, and sphincter disturbances. At the end of April 1998, the patient was transferred to our hospital for further investigation.

Examination revealed spastic paraparesis, bilateral Babinski’s sign, and a Th-12 sensory level. Erythrocyte sedimentation rate was 34. Complete blood count, tests for hepatic and renal function, angiotensin converting enzyme, concentrations of IgG, IgM, IgA, IgE, and immune complexes, screening for anti-nuclear (HEP-2 cells), anti-ds DNA, antineutrophil cytoplasmatic, antithrombochondrial, and antiparietal cell antibodies, rheumatoid factor, and the search for antineutrotropic virus and antiborrelia antibodies were normal or negative. A venereal disease research laboratory examination showed mild spastic paraparesis, bilateral Babinski’s sign, and a Th-12 sensory level.

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Electromyoneurography was normal. The appearance of the spinal cord damage resulting from ACA in our patient might have been facilitated by the simultaneous exacerbation of pre-existing neurological symptoms. The finding of antiphospholipid antibodies against cardiolipin and led to the complex mechanisms of involvement of intestinal helminths in the processes of autoimmune activity.

tation using a finger but there was a left homonymous field defect to a red pin and he had a left afferent pupillary defect. Fundoscopy showed bilateral optic atrophy. The remainder of the cranial nerve examination was normal. In the arms tone and power were normal, but coordination was mildly impaired on the right. The reflexes were exaggerated and Hoffman’s sign was present bilaterally. A palmpmntal reflex was present on the right. In the legs power was normal, but tone was increased and there were several beats of ankle clonus; reflexes were exaggerated and plantar responses were upgoing. Coordination was impaired in both legs, his gait was ataxic, and Romberg’s test was positive. He had a minor reduction in vibration sensation at the right ankle; otherwise sensation was normal. He appeared moderately tanned, but there was no other hyperpigmentation. Supine blood pressure was 114/78, falling to 108/80 on standing. The remainder of the examination was normal.

Routine biochemistry was normal. A morning cortisol was 469 nmol/l (normal >160 nmol/l), but a short synacthen test showed an abnormally flat response (serum

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Damage, gliosis, and neuronal loss.

By October 1996 his headaches had settled but his eyesight, memory, coordination, and walking were worse. Visual acuity was below 6/60 in both eyes. Brain MRI was repeated (figure C-E). By August 1997 there had been no new clinical developments (MRI figure F-G). In May 1998 he complained of navigational difficulties in familiar surroundings, further memory loss, and cognitive decline (MRI figure H-I).

In May 1996 (figure A) T2 weighted axial imaging showed high signal intensity areas in the region of the right lateral geniculate nucleus and left optic tract. The occipital white matter was normal. T1 weighted images with gadolinium contrast enhancement (figure B) showed bilateral enhancement of the optic and geniculate tracts. By October 1996 (figure C) T2 weighted axial imaging showed spread of the areas of high signal intensity continuously from the lateral geniculate nuclei posteriorly along the optic radiations into the white matter of both occipital lobes, more prominent on the right. T1 weighted images showed contrast enhancement in the optic chiasm and optic tracts (figure D), lateral geniculate nuclei, origins of the optic radiations, and right occipital white matter (figure E).

By August 1997 (figure F) there had been further progression in the white matter changes in both occipital lobes, with spread to the splenium of the corpus callosum. Contrast enhancement (figure G) was seen in the optic radiations and right occipital white matter. The cerebellar white matter was of low signal intensity, with a small area of contrast enhancement above the fourth ventricle to the right of the midline.

In May 1998 (figure H and I) the changes in white matter were yet more extensive with the appearance of ring enhancement.

Our case illustrates MRI appearances typical of adrenoleukodystrophy and demonstrates in particular the evolution of these changes with time. The tendency of this condition to affect the visual pathways selectively is well illustrated as is the spread of disease along the fibre tracts of that system. This allowed visualisation of parts of the visual system, the anatomy of which is usually hidden—for example, the intracerebral portion of the optic tracts. The characteristic MRI appearances are thought to result from an advancing front of active demyelination, followed by an area of inflammatory cellular response demonstrating contrast enhancement, surrounded by areas of established damage, gliosis, and neuronal loss.

Golf ball epilepsy

Blunt head injuries may cause epilepsy. We present the cases of four young people whose heads were all subject to contact with golf balls travelling at speed. Each had post-traumatic seizures, three early and one late, despite the apparent absence of post-traumatic amnesia. Although many patients who develop epilepsy recall some type of head injury preceding their first seizure, post-traumatic epilepsy probably accounts for less than 5% of all the epilepsies. There is good evidence that the risk of post-traumatic epilepsy increases with the severity of the injury. Thus, Jennett identified the presence of intracranial haemorrhage, dural laceration, and early post-traumatic seizures as the chief risk factors for late post-traumatic epilepsy. Annegers et al also emphasised that in the absence of a post-traumatic amnesia of 30 minutes or greater, there was no significant increased risk for the development of post-traumatic epilepsy.

From a practical point of view and for medicolegal purposes, it is necessary to decide if a seizure is post-traumatic. As a general rule it may be stated that if the person concerned does not give a history of a post-traumatic amnesia lasting for a significant period of time (an hour or more), and there is no history of a compound or depressed fracture with dural tear, it is reasonable to exclude the possibility that the epilepsy is post-traumatic. However, it is worth noting that this view is based on Jennett’s work and precedes CT. There is no good evidence from a large series to indicate whether findings on acute imaging add anything to the prediction of post-traumatic epilepsy.

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(A) CT showing acute extradural haematoma in patient 1. (B) CT 5 days after A showing persisting cortical abnormality after evacuation of extradural haematoma. (C) CT demonstrating minor depressed skull fracture at site of impact. (D) CT showing late cortical changes at presumed site of impact 4 years after injury.
Four examples of acute symptomatic seizures and epilepsy developing after head injuries with golf balls are described, which seem to be an exception to these clinical rules. An 11 year old boy was struck on the right temple by a golf ball resulting in right fronto-temporal haematoma. His consciousness was not impaired until about 3 hours later when he became drowsy and had two focal motor seizures affecting the left arm. He was intubated and ventilated. A head CT showed a right fronto-temporal haematoma with no skull fracture (figure A). The haematoma was evacuated (figure B). He was woken and extubated the next day and was discharged without adverse sequelae.

A 16 year old boy, who was a keen golfer with a single figure handicap, was struck on the head by a golf ball which rebounded several yards away after striking him on the forehead. He experienced local pain, bruising, and swelling. Although he was never unconscious, some 4–5 hours later he developed persistent jerking of the right face and arm. He was taken to his local casualty department where examination revealed a scalp laceration just above the ear at the point where he had been struck (similar in shape, but more hypertensive than the appearance in the figure B). The haematoma gave the distinct impression of a golf ball embedded in the surface of the cerebral hemisphere!

He was treated with parenteral anti-epileptic drugs and subsequently with thio-pentone requiring ventilation for 48 hours when he was loaded with phenytoin.

He was maintained on phenytoin for 12 months but subsequently this was withdrawn and he has remained seizure free.

A 5 year old girl was struck on the forehead above the right eye by a golf ball struck 10 metres away. On arrival in the accident and emergency department she was fully alert, orientated, and neurologically intact. A laceration was present but there had been no apparent loss of consciousness or vomiting. However, 90 minutes after the injury she had a generalised tonic clonic seizure lasting 25 minutes. She was intubated and a head CT scan showed a very small depressed fracture with minimal haemorrhagic contusion in the cortex of the right fronto-lateral lobe (figure C). She was woken and extubated later that day. She has had no further seizures since then.

A 12 year old boy was practising golf with a friend. He was struck on the front of the head by a golf ball which rebounded a considerable distance after striking him. He did not lose consciousness and had no more than localised pain, tenderness, and bruising at the site of impact. He did not seek any medical advice about the injury. Over the next 4 years he had three well documented tonic-clonic seizures that started out of sleep.

A CT scan 3 years after the original injury showed a small, wedge shaped area of low density affecting the cortex close to the point at which he recalls being struck (figure D).

The heads of these four young people were all subject to contact with golf balls which at club level travel at speeds of up to 130 miles/hour. Each had post-traumatic seizures, three were intubated, and two had drowsiness or impaired consciousness. The apparent absence of post-traumatic amnesia...

Patients 1 and 2 would indicate that this kind of injury is capable of transferring energy across the skull, independent of a skull fracture, to cause an acute extradural or cortical haematoma. In patient 4 the lesion identified at a later date by CT is consistent with the late consequences of a localised intracranial haematoma. It therefore seems reasonable to assume that the late epilepsy in patient 4 was also related to the initial golf ball injury.

In the third patient, a minor depressed fracture and contusion was again associated with an early seizure without evidence of intervening impairment of consciousness. It does therefore seem that golf ball injuries are capable of giving rise to acute symptomatic seizures and late epilepsy without causing post-traumatic amnesia, skull fracture or dural tear. CT evidence, however, would predict the possibility of seizures in these examples in whom the development of post-traumatic epilepsy probably results from the physical properties of golf balls and their ability to transmit considerable mechanical energy at a small site of impact. The problem is one of which spectators on golf courses (and their doctors) should be aware.

Sensory predominant neuropathy with GM antibodies, conduction blocks, and orbital pseudotumour

Two male patients developed multifocal sensory neuropathy with high titre IgM anti-GM antibodies (up to 1:64 000) and an infiltrative orbitopathy. Nerve conduction studies showed multiple motor conduction blocks and evidence of a similar phenomenon in sensory nerves. Both patients deteriorated after corticosteroid administration but benefited substantially from intravenous immunoglobulin therapy. Our findings suggest the existence of a predominantly sensory subtype of multifocal motor neuropathy (MMN) and challenge the prevailing motor specificity of anti-GM antibodies.

Anti-GM antibodies have been implicated in the aetiology of multifocal motor neuropathy (MMN) and are assumed to be specific for this disease when occurring at high titres. We report on two patients with high titre IgM anti-GM antibodies and electrophysiological features typical of MMN presenting with severe sensory neuropathy.

Patient 1 was a woman who developed asymmetric numbness of limbs and difficulty in performing fine motor movements among the age of 55. Sensory deficits showed a multifocal pattern (multiple mononeuropathy) and involved proximal limb regions, trunk, and face. The course of illness was steadily deteriorating with some episodes of prominent disease progression usually preceded by minor infections. After 10 years he was unable to write, needed assistance for dressing and walking, and complained of diplopia. Neurological examination showed profound sensory loss in all sensory modalities in the arms and legs and pseudoaesthesia of the fingers and wrist. Deep tendon reflexes were preserved and muscle strength was normal. The patient showed marked protrusion and downwards and outwards deviation of the left eye with a complex impairment of all eye movements.

Patient 2, a 68 year old man, reported an insidious onset and gradual worsening of asymmetric sensory neuropathy without evidence of sensory or dural tear. CT evidence, however, would predict the possibility of seizures in these examples in whom the development of post-traumatic epilepsy probably results from the physical properties of golf balls and their ability to transmit considerable mechanical energy at a small site of impact. The problem is one of which spectators on golf courses (and their doctors) should be aware.
Ganglioside antibody patterns and electrophysiological characteristics

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Nerve conduction studies:

- **Right median nerve:**
  - DL (ms)/NCV/NCV (m/s): 4.5/48/56
  - F wave latency (ms): 33.0
  - Motor conduction block: -
  - SNAP: Absent

- **Right ulnar nerve:**
  - DL (ms)/NCV/NCV (m/s): 2.6/56/50
  - F wave latency (ms): 32.5
  - Motor conduction block: +
  - SNAP: Absent

- **Right peroneal nerve:**
  - DL (ms)/NCV/NCV (m/s): 6.6/42/39
  - F wave latency (ms): 86.9
  - Motor conduction block: +
  - SNAP: Absent

**Antibody titres presented are those before treatment (baseline).**

SNAP = sensory nerve action potential; DL = distal latency; NCV = motor nerve conduction velocity in the following segments: median nerve: wrist-elbow (NCV1, normal >50 m/s), elbow-axilla (NCV2, normal >55 m/s); ulnar nerve: wrist-elbow (NCV1, normal >50 m/s), elbow-axilla (NCV2, normal >56 m/s); peroneal nerve: ankle-to-tibial head (NCV1, normal >42 m/s), tibial neck-popliteal fossa (NCV2, normal >45 m/s).

**Antibody attack is directed at the Gal(1-3)GalNAc epitope of GM1.** GD1b antibodies have shown to be subsumed under the term "multifocal motor-sensory neuropathy (MMSN)."

**We propose that multifocal neuropathies with conduction blocks and high titre anti-GM antibodies have a clinical range from predominantly sensory to predominantly motor variants and suggest that all these variants be subsumed under the term "multifocal motor-sensory neuropathy (MMSN)."** This concept is of clinical relevance in that all phenotypes share the same therapeutic peculiarities including good response to IV Ig and inefficacy (most cases) or even unfavorable effects of corticosteroids, which are first line drugs in the treatment of other immune neuromyopathies. Our report aims to increase awareness for sometimes prominent sensory involvement in MMNS and to facilitate early and accurate diagnosis in such patients.

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**Adrenalin**


**Correspondence**

Alterations of muscarinic acetylcholine receptor subtypes in diffuse Lewy body disease: relation to Alzheimer’s disease

The article by Shiozaki et al. demonstrating significantly less muscarinic receptor binding sites in the temporal cortex in dementia with Lewy bodies than in Alzheimer’s disease and different upregulation of the m1 and m2 receptor subtypes suggests differences in the manner of degeneration of the cholinergic system between both dementing disorders that may be of basic and practical therapeutic relevance. The more severe reduction of ChAT activity in the neocortex in dementia with Lewy bodies than in Alzheimer’s disease, the higher upregulation of the postsynaptic m1 receptor in dementia with Lewy bodies, and the higher level of the presynaptic m2 receptor subtype in Alzheimer’s disease suggest a severe depletion of presynaptic projection neurons in dementia with Lewy bodies but their relative preservation or upregulation in Alzheimer’s disease. These data are in line with previous—including personal—findings on cell loss and shrinkage in the cholinergic magnocellular posterior part of the nucleus basalis of Meynert in dementing neurodegenerative disorders. In Parkinson’s disease (brain stem type of dementia with Lewy bodies), cell depletion in the nucleus basalis of Meynert averages 30% to 40% without correlation with age or duration of the illness. It is much higher in demented patients with Parkinson’s disease (similar to Alzheimer’s disease) range 50% to 70% than in non-demented patients (0% to 40%), who show neuronal loss similar to or only slightly higher than age matched controls. Cell loss in the nucleus basalis of Meynert in non-demented patients with Parkinson’s disease is usually associated with little or no cortical Alzheimer’s disease pathology, whereas in severely demented patients with Parkinson’s disease, heavy cell depletion in the nucleus basalis of Meynert is often, but inconsistently, accompanied by severe cortical neuritic Alzheimer’s disease pathology suggesting threshold levels of cholinergic forebrain impairment and deficit for the development of dementia. Even more severe depletion of the nucleus basalis of Meynert with 75% to 80% loss of large cholinergic neurons found in dementia with Lewy bodies (figure). There were no major differences in cell loss in the nucleus basalis of Meynert between dementia with Lewy bodies and “plaque only” Alzheimer’s disease (two cases) and with “true” Alzheimer’s disease (eight cases with Braak stages V or VI). Lewy bodies and neurofibrillary tangles in the nucleus basalis of Meynert neurons were seen in eight brains of patients with Lewy body disease.
These changes are associated with a decrease in cholinergic innervation of the cortex and hippocampus that may or may not correlate with the severity of cell loss in the nucleus basalis of Meynert and mental status.

Neocortical cholinergic activity (choline acetyl transferase) is far more severely depleted in dementia with Lewy bodies than in Alzheimer’s disease and Parkinson’s disease, and correlates well with dementia and mortality. In Alzheimer’s disease (AD), Lewy body variant of Alzheimer’s disease (DLB), and age matched controls. Numbers in parentheses (A) Total number and (B) mean density of neurons in the magnocellular part (Ch4) of the nucleus basalis of Meynert in Parkinson’s disease (PD) with and without dementia, Alzheimer’s disease (AD), Lewy body variant of Alzheimer’s disease (DLB), and age matched controls. Numbers in parentheses are mean age (SD).}

Mortality from Parkinson’s disease

The publication of the 10 year mortality data from the Sydney multicentre study of Parkinson’s disease serves as a timely reminder that patients with Parkinson’s disease and dementia have a high mortality risk. The heterogeneity of degeneration of cholinergic neurons in the basal forebrain and its relative independence from cortical pathology suggests primary involvement of the basal forebrain in Alzheimer’s disease and dementia with Lewy bodies confirmed by defective retrograde transport of nerve growth factor to the nucleus basalis of Meynert in Alzheimer’s disease.

These morphological differences in the degeneration of the cholinergic forebrain system between various dementing neurodegenerating disorders are, at least in part, supported by the data presented by Shiozaki et al. indicating differences between Alzheimer’s disease and Parkinson’s disease. These and other genetic, morphological, and biochemical differences between the three disorders may strengthen the hypothesis that they represent different nosological entities. This, however, needs further confirmation.

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Anaphylactoid reaction to methylprednisolone. Is it surprising when pharmacological and immune effects of a drug differ?

Clear reports a case of anaphylactoid reaction to methylprednisolone which developed after starting treatment with interferon-β. She states that “allergic reaction to steroids is rare and anaphylactoid reaction to methylprednisolone rarer still with only three reports in the literature.” Her report surprised us as the week of publication of her case we had a patient with multiple sclerosis who developed an urticarial rash within 15 minutes of commencing treatment with intravenous methylprednisolone. Although we thought this to be an unusual response to methylprednisolone, we were not overly perplexed by the drug’s capacity to induce a presumably IgE mediated immune response. Surely for almost all drugs the pharmacological and immune properties are quite distinct.

I undertook a brief literature search. The database was interrogated using Medline Pubmed and the words “anaphylaxis” and “methylprednisolone”. At least 29 cases of anaphylactoid reaction to methylprednisolone are documented in this simple search. Kamm and Hagmeyer systematically review allergic reactions to corticosteroids in the April 1999 publication of *Annals of Pharmacotherapy*. Their primary data source is a Medline search from January 1966 to December 1997. They report 36 allergic-type reactions to intravenous corticosteroids, including death in 12 patients suspected to be related to corticosteroid anaphylaxis. Methylprednisolone and hydrocortisone were the most commonly implicated corticosteroids. Is it surprising that the frequency of reporting of anaphylactoid responses to corticosteroids is low? I can see no inherent paradox between the ability of methylprednisolone to bind IgE and its pharmacological anti-inflammatory action. Clear’s speculation about mechanisms by which interferon β may predispose to anaphylaxis may be interesting. However, it is unreasonable to ascribe the anaphylactoid response to methylprednisolone to therapy with interferon β.

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Clear replies:
Mea culpa! The disparity in yield of our literature searches reflects different search strategies. These are often problems in electronic search systems.

It is still reasonable to state, though, as Van den Berg and Van Eikema Hommes do in their report, that anaphylactoid reaction to methylprednisolone is rare. Few clinicians have come across it. I agree that it is unreasonable to ascribe the anaphylactoid response to methylprednisolone without adverse effect had
anaphylactoid reactions to the drug soon after the introduction of interferon β, and that such an unusual event should alert us to the possibility that interferon β may have paradoxical effects. If we see only what we expect to see we run the risk of missing the truth.

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Overall, although the book presents a series of short unrelated articles that often contain biases and no overall context for interpretation, it is of use to people familiar with the field of restorative neuroscience, but even then it is often only helpful in summarising small islands of work to those not familiar to the field, this book will be misleading and hard to follow, and as result it is unlikely to appeal to many neurologists or neuroscientists.

ROGER BARKER

Atlas of psychiatric pharmacotherapy.


What I liked most reading through the Shihol, Nutt, and Weizman’s Atlas of Psychiatric Pharmacotherapy is its completeness. It is indeed a monumental work on clinical psychopharmacology, divided into four main sections: basic principles of psychiatric pharmacotherapy, abused substances, drug interactions, and treatment strategies.

As a basic science researcher, I like the fact that these authors succeed, in the first section, in the very difficult task of translating complex biochemical mechanisms into concise pictures and legends. I particularly like those on second messengers/signal transduction pathways, as these are rare to find and difficult to understand in other books. Switching to more specific psychopharmacology topics, the tables explaining the mechanisms of action of the various drugs are also very well made and updated. For example, the tables illustrating the mechanisms of action of antidepressant drugs go beyond the “catecholamine hypothesis” into explaining the effects, at the genomic level, on the synthesis of growth factors. There is also a great deal of information on the side effects of psychotropic medications, including the pharmacological mechanisms involved. In this regard, the tables describing sexual dysfunctions are particularly useful, as they describe the physiology and the pharmacology of sexual functions in both males and females.

The second section deals with well established as well as novel findings in the field of substance abuse. For each substance, the book explains the receptor mediated effects, the acute and chronic effects on the neuro-endocrine-psychiatric effects, and the biological mechanisms responsible for dependence, adverse effects, and treatments. The book also gives up to date information on drugs for which biological pathways are less well known, such as phenylcyclohexil and LSD.

The third section is on drug interactions. For each class of medication—and, if relevant, for each single drug—the book lists different drugs that are contraindicated or interactions that are decreased or increased by the index drug. The book also deals with the clinical implications of these interactions, including the relationship between drug interactions and clinical efficacy. The book is particularly useful for people interested in clinical pharmacology and for those who need to be aware of potential drug interactions.

In summary, the Atlas of Psychiatric Pharmacotherapy is clearly the result of a detailed and updated revision of the literature in all fields of psychopharmacology, from basic science to treatment of rare psychiatric conditions. It may be too complex to be used as a “quick reference” by the busy clinician, or for people without prior knowledge of the topic. It is possible, therefore, that the book could not reach these two stated target audiences. However, it is well suited to be used in “various academic spheres” (the third stated target). In an academic setting, this book will be used as a teaching tool or as a consultation book to find important details that are not readily available from other sources. The book also has two other minor shortcomings: the absence of an index and some misspellings.

CARMINE M PARIANTE

CORRECTION


In this paragraph, figs 4 and 5 were wrongly ascribed the legends for figs 4 and 5 and figs 4 and 5 were given the legends for figs 2 and 3.