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FOCUS ON NEUROLOGY

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The Singapore Family Physician

Focus On Neurology

"The disease is of long duration, to connect, therefore, the symptoms which occur in its later stages with those which mark its commencement, requires a continuance of observation of the same case, or at least a correct history of its symptoms, even for several years."

James Parkinson (1755 –1824)
Essay on 'The Shaking Palsy'

Family physicians are often confronted with neurological dilemmas in the course of their daily practice. James Parkinson's description of this dilemma is very evident in his essay on "The Shaking Palsy", which epitomises most neurological diseases and aptly described the disease which was eventually named after him.

This issue, Focus On Neurology, begins with a review of Parkinson's Disease and its management strategies, which is very knowledge-based and hence requires frequent review of its intriguing symptomatology as discussed by Dr. Adrian Tan, Consultant Neurologist at Tan Tock Seng Hospital.

No discussion on clinical neurology is complete without discussing the two most common neurological symptoms in family practice, that of giddiness and headaches, as well as the two most common neurological manifestation of Hypertension and Diabetes mellitus, that of Stroke and Diabetic Neuropathy.

Neurology encompasses the two extreme ends of the systems, the Brain where all neurological activities initiates, and possible diseases such as Brain Tumours and Epilepsy, and the Muscles where the neurological activities and its disease processes eventually manifest.

We also explore the mysteries of sleep with an unusual topic, "Excessive Daytime Sleep", the excitement of Neurological Emergencies, and cut the ice with an insight into Interventional Neuroradiology.

Focus on Neurology should provide for a sound knowledge-based practice in Neurology to complement the much talked-about evidence-based management.

Dr Arthur Tan Chin Lock

The Singapore Family Physician

Parkinson's Disease – A Review Of The Illness & Management Strategies

A Tan

Parkinson's disease (PD) is a slow progressive neurodegenerative disorder with no identifiable cause. Some researchers postulate that it may be due to oxidative stress and overproduction of free radicals, as evidenced by reduced levels of Complex I in the mitochondria, increased iron deposition in the substantia nigra, reduced levels of reduced glutathione and increased amounts of lipid peroxides in the brain. Many others feel that it is a combination of an environmental factor coupled with a genetic susceptibility that leads to PD. Pathologically, PD is characterised by loss of pigmented neurons and gliosis in the substantia nigra pars compacta and locus ceruleus, and the hallmark feature of Lewy bodies within these degenerating neurons.

The cardinal signs of parkinsonism are rest tremor, bradykinesia, rigidity and postural instability. To make a diagnosis of parkinsonism, 2 of the cardinal signs must be present, of which one must be either rest tremor or bradykinesia. Causes of parkinsonism can be divided into primary (idiopathic), secondary, parkinson's-plus syndromes or the hereditary neurodegenerative diseases. A common secondary cause of parkinsonism is due to the ingestion of dopamine-receptor blocking agents such as neuroleptics and even drugs used for gastric symptoms like prochloperazine or metoclopramide. Parkinson's -plus syndromes are excluded by carefully asking and examining for orthostatic hypotension, cerebellar signs, pyramidal tract signs, eye movement abnormalities and a poor response to levodopa. They are further suspected if postural instability or speech problems develop early, usually within the first 2 years of onset.

Table 1 : Signs of Parkinsonism

Cardinal signs
Rest tremor
Rigidity
Bradykinesia
Postural Instability
Secondary signs
Masked facies
Glabellar reflex
Dysarthria
Constipation
Pain/parasthesias
Seborrhea

Table 2 : Parkinson's-plus syndromes and secondary Parkinsonism

Parkinson's-plus	
Multiple system atrophy-	Olivopontocerebellar atrophy
	Striatonigral degeneration
	Shy-Drager syndrome
Progressive supranuclear palsy	
Corticobasal ganglionic degeneration	
Diffuse Lewy body disease	
Secondary Parkinsonism	
Drug-induced(neuroleptic medications, metoclopramide, methyldopa)	
Vascular(multiple infarcts)	
Structural(brain tumour, hydrocephalus)	
Toxin(manganese, carbon monoxide, MPTP, cyanide)	
Infections(post-encephalitic)	

The prevalence of PD varies from 70-200 per 100,000 and there appears to be a slight male preponderance. In epidemiological studies, PD appears to be more prevalent in rural areas where residents are exposed to pesticides and well-water. Maternal twin studies seem to suggest that, for late-onset PD, the genetic contribution appears small, and environmental factors may be more important in the etiology of the disease. Recently, researchers have found a gene mutation in chromosome 4 for one of the rare families with inherited PD. The gene codes for alpha-synuclein, a protein involved in neuronal plasticity, and by understanding how this protein works, researchers may someday fine a better treatment for PD.

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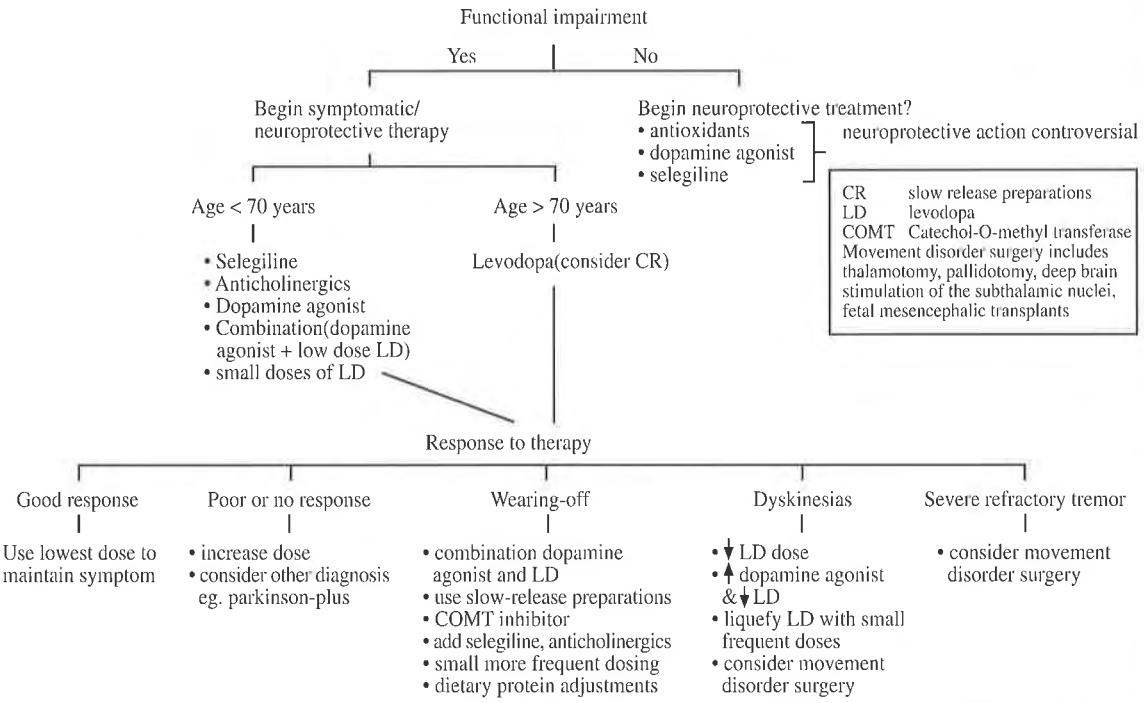
There are many medications used to treat PD and they can be categorised as anticholinergics, monoamine-oxidase B inhibitors, amantidine, dopamine agonists, catechol-O-methyltransferase (COMT) inhibitors and levodopa. One general principle of treatment is that patients are only started on medications if their symptoms are severe enough to affect their livelihood or activities of daily living. 75% of patients started on levodopa will develop motor fluctuations 5 years later. Exercise and physiotherapy must be encouraged as it helps patients in maintaining their strength and suppleness. For patients less than the age of 60 years, one generally would like to avoid using levodopa until a later and more severe stage. Starting with dopamine agonists is a good strategy and some studies have shown that this may delay the onset of motor fluctuations compared with starting the patient on levodopa straightaway. Anticholinergics are not advised for the elderly because of the side effects of memory deficits, confusion, dry mouth, constipation and urinary retention. A flow chart is included as a guide for treatment (see Figure 1 below).

Fig. 1 **Algorithm for management of Parkinson's disease**



Wearing off is one of the most common complications after several years of therapy. One of the best ways of treating this is to use controlled-release preparations of levodopa such as Madopar HBS or Sinemet CR, or one can add a dopamine agonist and slowly build it up to adequate dosages. When encountering hallucinations, confusion or psychosis, the medications to reduce in descending order of importance are anticholinergics, dopamine agonists and lastly, levodopa. If these symptoms are still a problem, using an atypical neuroleptic such as clozapine or olanzipine may help. Motor fluctuations that are seen besides wearing off include levodopa dyskinesias, on-off, random off, off dystonic cramps. Medication adjustments to alleviate these problems require experience, expertise and a great deal of patience. If one has exhausted all avenues of drug treatment, then Parkinson's surgery may have to be considered.

Parkinson's surgery involves stereotactic functional neurosurgery. This is a minimally invasive procedure where a stereotactic frame is placed on the patient's head, the brain is mapped using MRI and stereotactic atlases and an electrode is advanced into the deep subcortical nuclei of the brain. The 3 most common targets are the ventral intermediate nucleus of the thalamus, globus pallidus interna or subthalamic

nucleus. A radiofrequency lesion is made or stimulating electrodes are connected to a pulse generator (deep brain stimulation). The thalamic target is very effective for alleviating tremor, but little else, whereas the other 2 targets can improve other symptoms of Parkinson's disease. Parkinson's surgery is not suitable for Parkinson's-plus syndromes or in very advanced PD where the patient is bed-bound, without any response to levodopa. It has to be stressed that this surgery cannot be taken lightly as there is a 1% risk of intracerebral hemorrhage.

Experimental therapy for Parkinson's disease is at an exciting stage. Although experiments in fetal transplantation have been ongoing for several years, it is only recently that 2 large controlled trials have been staged in North America. Preliminary data from Swedish studies appear to indicate that fetal transplantation can not only treat most of the cardinal signs of PD, but may also improve falling and freezing, two problems which are not readily amenable to drug treatment. However, fetal transplantation requires well-established expertise in cell harvesting and culture, and the ethical issues involved are tremendous. Neurotrophic factors like glial derived neurotrophic factor (GDNF) is under extensive investigation, and animal studies demonstrate that GDNF can promote neurite outgrowth in the remaining neurons of the substantia nigra. Very recent advances include alternative cell transplants such as xenographic tissue transplants, and gene therapy.

Therefore, we have come a long way since the first description of Parkinson's disease by James Parkinson in 1817, the finding of dopamine deficiency in the striatum by Ehringer and Hornykiewicz in 1960, to the present day multitude of drug therapies and new techniques of surgical treatment. Clinicians look forward to the day when we can prevent the disease or arrest the progression of this debilitating illness.

Giddiness in General Practice

C B Tan

Giddiness is a very common complaint in general practice. Unfortunately, giddiness is also a non-specific term, representing several different overlapping symptoms. Near-faint giddiness for example, refers to the light-headed sensation prior to actual loss of consciousness. It is due to reduced cerebral blood from diverse causes including orthostatic hypotension, vaso-vagal attacks and hyperventilation. Cardiac arrhythmias, cardiomyopathy, pericarditis and valvular heart diseases can also reduce cardiac output, leading to near-syncope from decreased cerebral perfusion. Other patients who complain of giddiness may have disequilibrium, which refers to a sensation of imbalance, usually when walking or standing. This is a common problem in the elderly with multi-modality sensory deficits, where there is partial loss of visual, proprioceptive input and vestibular impairment. Giddiness described as a sensation of floating and fatigue is a common complaint in anxiety. Hypoglycemia may lead to light-headedness, lethargy and confusion and is easily recognised in a diabetic patient on insulin or oral sulfonylurea treatment. Only vertigo, an illusion of rotatory movements is specific for disorders of the vestibular system. Vestibular dizziness can manifest as an acute prolonged attack of vertigo, recurrent spontaneous attacks of vertigo or recurrent episodes of positional vertigo.

Acute spontaneous vertigo results from a sudden unilateral impairment of vestibular function. It can result from damage either to the peripheral labyrinth and vestibular nerve or the central vestibular nucleus and vestibulocerebellar tract in the brainstem. In a patient with acute prolonged vertigo, it is essential to identify patients with potentially life-threatening central vestibular disorders from those with more benign peripheral vestibular diseases, through a careful history and thorough neurological examination. Tinnitus and hearing loss when present indicate a peripheral cause. Furthermore, patients with peripheral vestibular disorders are usually able to walk as opposed to those with central vestibular lesions. Nystagmus, which is a hallmark of vestibular deficit, does not change in direction with gaze to either side with peripheral lesions. In contrast, nystagmus of central origin changes direction when the patient looks away from the direction of the fast phase. Nystagmus of peripheral origin, usually horizontal beating is inhibited after a few days whereas nystagmus of central origin can be vertical and persists for weeks to months. Common peripheral causes of vertigo seen in general practice include vestibular neuronitis, viral neurolabyrinthitis and bacterial otomastoiditis. Cerebellar infarction or hemorrhages are uncommon but important central causes of prolonged attacks of vertigo in clinical practice. In these disorders, the patient often cannot walk or stand and vertigo does not improve during 24 to 48 hours of observation. A magnetic resonance scan is usually required to establish the diagnosis. Both these conditions can lead to a mass effect in the tight posterior cranial fossa with resulting fatal compression of the brainstem. Surgical decompression is often life saving when clinical signs of brainstem dysfunction or hydrocephalus develop.

Recurrent spontaneous attacks typically last from minutes to hours. In transient ischemic attacks of the posterior circulation, recurrent vertigo is seldom longer than 5 minutes and may be accompanied by other symptoms of brainstem dysfunction. In contrast, peripheral inner ear causes of recurrent vertigo like Meniere's disease typically last hours. The definitive diagnosis of Meniere's disease is dependent on finding the characteristic low-frequency hearing loss associated with attacks of vertigo.

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Benign positional vertigo is a common cause of recurrent episodes of positional vertigo, although some cases are of central brainstem or cerebellar origin. These episodes of vertigo are usually brief and are triggered off by changes in head position. Positional vertigo is usually a benign condition that can be cured easily at the bedside, although in rare cases it can be a symptom of a central lesion. It is caused by freely floating calcium carbonate crystals within the posterior semicircular canal that shift

under the influence of gravity. The diagnosis can be confirmed at the bedside with the Dix-Hallpike maneuver. The patient is rapidly moved from the sitting to the head-hanging position and observed for vertigo and nystagmus. Torsional nystagmus lasting less than 30 seconds and fatigable with repeated testing is induced, with the affected ear facing down during the positional testing. In contrast, central positional nystagmus is nonfatiguing and purely vertical. Causes of central positional vertigo include cerebellar tumors, multiple sclerosis and Arnold-Chiari malformation. Neuroimaging is required to confirm the diagnosis of these rare central disorders.

Drug name	Brand name	Dosage
Vestibular suppressants		
Diphenhydramine	Benadryl	25-50 mg qds
Promethazine	Phenergan	25 mg qds
Cyclizine	Marzine	50 mg tds
Cinnarizine	Stugeron	25 mg tds
Betahistine mesylate	Merislon	6 mg tds
Betahistine HCL	Serc	8 mg tds
Diazepam	Valium	2-5 mg tds
Lorazepam	Ativan	1-2 mg tds
Clonazepam	Rivotril	0.5 mg tds
Anti-emetics		
Prochlorperazine	Stemetil	5-10 mg qds
Chlorpromazine	Thorazine	10-25 mg qds
Metoclopramide	Maxolon	10 mg tds
Domperidone	Motilium	10 mg tds

Table 1. Vestibular suppressants and anti-emetics

Therapy of vertigo is directed towards the underlying illness. Most peripheral causes of vertigo are benign and self-limited. They usually require only symptomatic treatment with vestibular suppressants and anti-emetics (Table 1). Vestibular suppressants are efficacious for acute spontaneous vertigo that lasts several hours. When nausea and vomiting are prominent, an antiemetic may be added to control symptoms. Brief attacks of vertigo caused by benign positional vertigo cannot be controlled by ingestion of a suppressant at the time of the attack, as there is inadequate time to achieve effective blood level. Canalith repositioning maneuvers should be employed, as they are effective in approximately 80% of patients. These maneuvers are designed to move the floating calcium debris that triggers the vertiginous attacks, out of the semicircular canals. Vestibular suppressants should not be used to treat chronic dizziness of nonvestibular origin. General practitioners who encounter patients with suspected central causes of vertigo should refer them to tertiary centres for further management. These disorders are often life-threatening and require neuroimaging studies for definitive diagnosis and specialised treatment.

Reference

1. Robert W. Baloh. Dizziness, Hearing Loss and Tinnitus : F A Davis 1998

The Singapore Family Physician

What Oral Medications are Useful In Stroke?

S H Lee

Introduction

Stroke is the third commonest cause of death and the leader of disability in developed countries. It has been estimated that half the strokes can be prevented if all modifiable risk factors were controlled. In Singapore, ischemic stroke comprises 75% of all strokes. This paper discusses the use of cost-effective, evidence-based oral medications for prevention of ischemic stroke.

Primary Prevention

Every physician can identify those patients at increased risk of stroke. Most of the atherosclerotic and cardiac risk factors can be diagnosed by bedside examination or by simple tests: hypertension, hypercholesterolemia, smoking, diabetes mellitus, atrial fibrillation, and valvular heart disease (mitral stenosis).

An overview of 14 treatment trials showed that reduction of diastolic blood pressure by 6 mmHg resulted in a reduction of stroke incidence by 42%. Similarly, primary preventive trials in elderly with hypertension or isolated systolic hypertension using thiazide diuretics, beta-blockers, or dihydropyridine calcium channel blockers (with or without addition of ACE-inhibitors) showed that stroke risks were reduced by half. These data conclusively dispel the concern that reduction of raised blood pressure to below 140/80 mmHg in hypertensive patients would precipitate stroke.

Meta-analysis of preventive trials in ischemic heart disease (IHD) by lowering cholesterol showed that these benefits also extend to prevention of stroke. Reduction of moderately elevated total cholesterol (average 5.4 mmol/L) and elevated LDL-cholesterol (average 4.4 mmol/L) by 30% to 40% using HMGcoA-reductase inhibitor ("statins") resulted in a reduction of stroke incidence by half. Interestingly, treatment with fibrates, resins, and dietary interventions was not effective. Treatment along the American National Cholesterol Education Program (NCEP) guideline is recommended. Oral medication is started at the following LDL-cholesterol level: greater than 4.9 mmol/L for patients with less than 2 atherosclerotic risk factors; greater than 4.1 mmol/L for those with more than 2 atherosclerotic risk factors; and greater than 3.4 mmol/L for those with IHD. The endpoint of therapy is less than 4.1 mmol/L, 3.4 mmol/L, and 2.6 mmol/L, respectively.

Atrial fibrillation (AF) is a powerful risk factor for ischemic stroke, increasing the risk by up to 8% per year for initial stroke. Anticoagulation with warfarin (INR 2 to 3) reduces the risk of stroke by two-thirds. Warfarin is indicated in all patients with AF, with the possible exception of those below age 65 who are free of structural heart disease with no history of hypertension, diabetes, TIA, stroke, or recent cardiac failure. Aspirin 300 mg/day is recommended for those who are unable to tolerate anticoagulation.

Secondary Prevention

Identifying the mechanism of ischemic stroke is pivotal in selecting the best secondary preventive therapy. For practical purposes, ischemic stroke can be classified into 3 subtypes according to the mechanism of infarct: cardioembolism, extracranial carotid artery stenosis, and intracranial atherosclerosis.

Cardioembolic stroke is suspected if at least one of the following risk factors is present - AF, cardiomyopathy, recent myocardial infarct, mitral stenosis, metallic prosthetic heart valves, or echo

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evidence of patent foramen ovale, akinetic segment, diffuse hypokinesia, poor left ventricular function, or mural thrombus. Extracranial carotid artery stenosis is best detected by duplex Doppler carotid ultrasound, whereas intracranial atherosclerosis is usually inferred from the presence of atherosclerotic risk factors.

Patients with cardioembolic strokes should be anticoagulated (INR 2 to 3) to reduce the risk of recurrent stroke by half. Those with prosthetic mechanical heart valves usually require higher anticoagulation (INR 2.5 to 3.5). If the patient develops recurrent embolism despite anticoagulation, addition of aspirin 100 mg/day is recommended with a slightly increased risk of bleeding.

For non-disabling stroke or TIA associated with ipsilateral extracranial carotid artery stenosis (70% to 99% diameter stenosis), carotid endarterectomy and aspirin 300 mg/day significantly reduce the relative risk of recurrent stroke at 2 years by two-thirds.

For stroke or TIA caused by intracranial atherosclerosis, aspirin 100 to 300 mg/day is the most widely used anti-thrombotic therapy in the world for stroke prevention. So far, no single antiplatelet agent has been shown to be conclusively better, cheaper, or less toxic than aspirin. Aspirin is equally efficacious in men and women, in young and old, in diabetics and nondiabetics, and in patients with and without hypertension. Lifelong therapy is recommended as long as the risk factor persists.

As for aspirin failure, a few options are available but none of them has been conclusively proven. Most physicians would switch the therapy to ticlopidine 250 mg BD. Others may change to anticoagulation (INR 2 to 3), double the dose of aspirin, or add slow-released dipyridamole 400 mg/day. For patients unable to tolerate aspirin, the following alternative drugs are recommended: ticlopidine, clopidogrel, warfarin, or dipyridamole.

References

1. Barnett HMJ, Mohr JP, Stein B, Yatsu F. Stroke: Pathophysiology, Diagnosis, and Management. 3rd edition, 1998.

2. Lee SH, Tjia H. Stroke in a multiracial oriental country, Singapore - The Moulmein Stroke Registry. J Neurol Sci 1997;150:S257

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Treatment of Diabetic Neuropathy

T Umapathi

The commonest polyneuropathy that a family practitioner would encounter is Diabetic Neuropathy The focus of this discourse would therefore be on the management of this common disorder and the symptomatic treatment of neuropathy in general.

It has been estimated that 66% of Insulin Dependent and 59% of Non-Insulin Dependent diabetic patients have neuropathy[1]. The incidence is related to the duration and the level of metabolic control of the disease[2].

There are a number of ways Diabetes Mellitus can affect the peripheral nervous system:

1) **Symmetrical Distal Axonal Sensorimotor Polyneuropathy**
2) **Asymmetrical Neuropathy**

a) Cranial mononeuropathies
b) Truncal or thoraco-abdominal radiculopathy/neuropathy
c) Entrapment neuropathy (commonest being Carpal Tunnel Syndrome and ulnar neuropathy at the elbow)
d) Diabetic amyotrophy-proximal lumbosacral plexopathy/ radiculopathy.
e) Multiple limb mononeuropathies

The former is the commonest variety. In this condition, patients who have had Diabetes Mellitus for a number of years complain of numbness of all four limbs of insidious onset with gradual and chronic progression. The pathology, being diffuse and axonal, the neurological deficit (sensory more than motor) is symmetrical and distal.

The following six questions outline the approach to his disorder:

1) Is there another cause for the polyneuropathy in the patient?

Thorough history (including family history), complete physical examination and simple investigations including full blood count, sedimentation rate, electrolytes, vitamin B12 and thyroid hormone level would exclude the other common causes of neuropathy like Alcoholism, Uraemia, Drugs, Paraneoplastic disease B12 deficiency and inherited neuropathies.

2) Are there any co-existing conditions that may be exacerbating the neuropathy?

The commonest factors would be excessive alcohol intake, neurotoxic drugs (eg isoniazid, vincristine) and entrapment neuropathies. These conditions have to be addressed.

3) Does the patient have autonomic nervous system involvement?

7% of IDDM and 5% of NIDDM patients are estimated to have autonomic neuropathy[1]. Symptoms of postural giddiness, impotence, gastroparesis, nocturnal diarrhoea and urinary incontinence ought to be elicited. Blood pressure supine and after standing for 3 minutes should be recorded. It is important to recognise the presence of autonomic neuropathy for at least two reasons:

a) Some of these disorders may need treatment on their own merit eg impotence and symptomatic postural hypotension causing falls.

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b) One has to be aware of inadvertently exacerbating these conditions like inducing symptomatic postural hypotension with antihypertensive drugs and aggravating impotence with beta-blockers.

4) Can anything be done to slow the progression of Diabetic Neuropathy?

The Diabetes Control and Complication Trial[2,3] has shown that tight control of blood sugars reduces the development of polyneuropathy by 64%. It is unlikely that any other therapeutic measure in the near future can achieve this quantum of benefit. New therapeutic agents that are being studied for the treatment of diabetic neuropathy in clinical trials include alpha-lipoic acid, gamma-linolenic acid (a major component of evening primrose oil) and neurotrophic factors.

5) Is patient prone to complications of neuropathy eg neuropathic ulcers, neuropathic joints?

This has to be evaluated and appropriate treatment instituted. The education on the care of the diabetic foot is even more urgent if there is associated vasculopathy or dermopatpy.

6) Is the patient having any disturbing "positive" symptoms like painful dysesthesia or lancinating pain?

These symptoms have to be treated. These symptoms that may appear in other forms of neuropathies are treated similarly.

The first drug that is used is a tricyclic antidepressant like Amitriptyline at doses like 5 to 25 mg at night. Rarely should one need to use higher doses. The adverse effects to monitor are drowsiness, postural hypotension or exacerbation of prostatism.

Carbamazepine at 200 to 400 mg three times a day is useful especially for the lancinating pains resembling trigeminal neuralgia. It is imperative that very low doses are started as patients develop severe vertigo. It may take up to a few weeks before the above therapeutic doses are attained. It is also recommended that total white counts be monitored at the start of therapy.

A relatively new drug that has been tried sucessfully in painful diabetic neuropathy is Gabapentin. If cost is not a constraint, this can be tried at 300 to 800 mg three times a day.

Neuropathy due to Diabetes Mellitus is a condition that is seen more often by the general practioner then the neurologist. Hence it is important that primary care physician have a good understanding of Diabetic Neuropathy and are able to take measures to slow its progression and treat its complications.

References:

1) Dyck PJ, Kratz KM, Karnes JL, et al. The prevalence by staged severity of various types of diabetic neuropathy, retinopathy and nephropathy in a population-based cohort: the Rochester Diabetic Neuropathy Study. Neurology 1993;43:817-824.
2) Diabetic Control and Complications Trial. Effect of intensive diabetes treatment on nerve conduction in the Diabetes Control and Complications Trial. Ann Neurol 1995;38:869-880.
3) Diabetes Control and Complications Trial. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med 1993; 329:977-986.

Editor's Note

Findings from the KKPDS on neuropathy were as follows:
There was no significant difference between conventional and intensive treatments in the incidence of absent ankle and knee jerks or heart rate variability to deep breathing and standing.

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Diseases of Muscles

W C Yee

The range of diseases affecting muscle is wide, but may be broadly divided into those that are inherited or genetic, and those that are acquired. Of the acquired muscle diseases, the inflammatory myopathies are common, and with the exception of inclusion body myositis, are usually amenable to treatment. Concerning the genetic muscle diseases, of which the muscular dystrophies are most familiar, there is often an unfortunate attitude of nihilism. However, some of the most remarkable scientific discoveries of the past 1–2 decades were made, and are being made, among this group of genetic muscle diseases.

Classification of Muscle Diseases

- Muscular Dystrophies
  - Duchenne and Becker MD
  - Limb Girdle MD
  - Facioscapulohumeral MD
  - Myotonic dystrophy and other myotonic disorders
  - Other dystrophies
- Congenital Myopathies
  - Nemaline, central core, myotubular myopathies
- Periodic Paralysis
  - Hypokalemic, Hyperkalemic
- Inflammatory Myopathies
  - Polymyositis, dermatomyositis
  - Inclusion body myositis
  - Acute viral, HIV, parasitic
- Metabolic Myopathies
  - Endocrine myopathies – thyroid, adrenal, steroid, parathyroid
  - Drugs, toxins, nutritional
  - Glycogen storage disorders
  - Mitochondrial myopathies
  - Lipid myopathies

There are only a limited number of ways in which muscle diseases present to the physician. In the great majority, it is as weakness, with or without wasting. Patients with aches and cramps are not uncommon in any general practice, but it must be stated that true muscle disease occurs only in a minority of these patients. The ready use of screening laboratory tests may turn up an unexpectedly high creatine kinase level, thereby raising the question of a muscle disease. Other presentations though uncommon, are often very distinctive, such as episodes of paralysis. Hypotonia is an important form of presentation in infants and young children.

Common Presentations of Muscle Diseases

1. Weakness and wasting
2. Aches and Cramps
3. HyperCKemia
4. Hypotonia
5. Periodic Paralysis
6. Fatigue
7. Rhabdomyolysis
8. Non-motor problems

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The box below shows a rough algorithm for evaluating the most common presentation in muscle diseases –weakness, with or without wasting. After being convinced that the patient is truly weak, one needs to sort out the other causes of weakness besides muscle disease – such as UMN syndromes, and diseases of the anterior horn cell, peripheral nerve and neuromuscular junction. Certain signs may be suggestive of other disorders, eg. fasciculations in anterior horn cell disease, fatigability in neuromuscular junction disease such as myasthenia gravis. When a muscle disease is thought likely, the pattern of weakness and certain specific muscular signs could be helpful in identifying a specific muscle disease. Other hints, such as family history and non-muscle complications, eg skin lesions in dermatomyositis, may also help in this diagnosis.

Evaluation of Weakness in Muscle Diseases

1. Is there true weakness?
2. Exclude UMN weakness
3. Consider sites of pathology : motor neuron – peripheral nerve – neuromuscular junction – muscle
4. Clinical points with regards to (3) :
   - Fasciculations
   - Sensory signs
   - Tendon reflexes
   - Fatiguibility
5. Patterns of weakness and wasting
   - Proximal vs distal
   - Symmetric vs asymmetric
   - Specific/selective muscle involvement
6. Specific muscular signs
   - Myotonia
   - Pseudohypertrophy
   - Tenderness
   - Contracture

The case for making an accurate diagnosis in muscle diseases cannot be overstated. Diagnosis must be certain if immunosuppressive agents with potential side effects are to be used in an inflammatory myopathy. However, it is also essential in the genetic muscle diseases. How else can one provide genetic counselling, consider therapy, or offer a prognosis to an anxious parent? In general, muscle biopsy is often necessary in making a diagnosis. While the surgery is simple, expertise in histological techniques and interpretation is critical for diagnosis. Gene diagnosis is possible for a number of the genetic diseases, any may provide the final confirmation of these diseases.

Diagnostic Studies in Muscle Diseases

1. Muscle enzymes – creatine kinase, aldolase
2. Tests of systemic disorders – eg. thyroid function tests, electrolytes, autoimmune indices
3. EMG and nerve conduction studies
4. Muscle biopsy
5. Gene diagnosis

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Advances in Genetics of Muscle Diseases

Research in the past 10 to 15 years have led not only to the location of the gene for a number of genetic muscle diseases, but also to identification of the gene product which is abnormal in the disease. We now know that Duchenne and Becker MD are due to disorders of the same gene in the X chromosome, coding for a protein, named dystrophin, that is essential for the integrity of the muscle membrane or sarcolemma. Dystrophin is almost always absent in the sarcolemma in Duchenne's and present in reduced amounts in Becker's. We can actually stain for dystrophin in muscle biopsies, a technique used in the diagnosis of these disorders. Similarly, the responsible genes for some of the limb girdle MDs have been located and their gene products identified to be members of a family of sarcolemmal proteins associated with dystrophin called the sarcoglycans. Indeed, new terminology has arisen for these diseases – namely the dystrophinopathies and the sarcoglycanopathies. We can also identify the sarcoglycanopathies by staining for the relevant sarcoglycan protein in muscle biopsies. Other important gene discoveries relate to the periodic paralysis syndromes and some of the myotonic syndromes, which have been related to genes coding for ion channels present in muscle membrane – hence the new terminology, the channelopathies. The pace of discovery is accelerating, with genes and gene products for genetic muscle diseases announced with impressive regularity.

The table below summarises important measures in managing a patient with a severe muscular dystrophy. The aim is to improve the quality of life of these patients – by optimising and extending their motor functions, and in particular, their ability to ambulate. In this regard, the prevention of complications – muscular, skeletal and non-muscular – are just as important. Prednisone has been shown to extend the ability of ambulate by 2 to 3 years in Duchenne MD, but this treatment remains controversial and should be reserved for selected cases. Management must include the family, for these diagnoses have serious consequences for the family – the need for genetic counselling, psychological and socioeconomic assistance. As will be obvious, the proper management of these patients requires the participation of a team of therapists – physiotherapists, physical medicine physicians, orthotists, geneticists, social workers, orthopedic surgeons, and even cardiologists and pulmonary physicians – orchestrated by the neuromuscular neurologist. As for the future, gene discoveries leads to further research in gene therapy. Although that progress appears slow, we can nevertheless remain hopeful that a cure is on the horizon.

Treatment of Muscular Dystrophies

1. Prevention of muscular and skeletal complications, eg contractures, scoliosis
2. Maintenance and extension of motor function and ambulation – physical aids, pharmacological – steroids?
3. Management of non-motor complications, eg cardiac disease, anaesthetic risks
4. Psycho-social management
5. Genetic and family counselling
6. Gene therapy in the future

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Neurological Emergencies

H C Chua

Neurological emergencies are among the most sudden and catastrophic of all medical emergencies. The spectrum of neurological emergencies include coma, stroke, status epilepticus, brain infections, myasthenic crisis and Guillain-Barre syndrome.

Coma is one of the most common emergencies requiring hospital admission.[1] The two components of consciousness are awareness and arousal or wakefulness. The former is a cortical function whereas the latter is mediated by the reticular activating system in the brainstem. Impaired consciousness is due to either diffuse bilateral cortical failure, brainstem failure or a combination of both. Coma may be due to anatomical or metabolic causes. Examples of the former include supratentorial lesions with brain herniation and primary brainstem pathology, of which the most common cause is basilar artery occlusion. Metabolic coma is suspected when the depth of coma is not proportional to either the neurological or anatomical findings. Common causes include hypoglycemia, drug and alcohol overdose, hyponatremia, seizures and hepatic and renal encephalopathies.

Stroke is one of the most important neurological emergencies in clinical practice. Intravenous thrombolysis is given to patients with ischemic stroke who present within 3 hours of symptom onset. The rationale for thrombolysis is because 80 to 90% of cerebral ischemic symptoms within 24 hours of stroke are due to atherothrombotic or atheroembolic occlusions. Patients treated with thrombolysis have an improved functional outcome at three months, but they have a high risk of symptomatic intracranial hemorrhage.[2]

Status epilepticus is defined as more that 30 minutes of either continuous seizure activity or 2 or more seizures without recovery of consciousness in between. It presents as either generalized convulsive seizures, non-convulsive status or repeated partial seizures.[3] Precipitating causes include brain infections, stroke, trauma, tumors, anoxia, metabolic causes and ethanol and drug-related causes. Status epilepticus may be treated with intravenous diazepam followed by phenytoin. Intravenous lorazepam is preferred to diazepam because of its long duration of action (4 to 14 hours). The dose of lorazepam is 4 mg iv which may be repeated if necessary. If seizures continue, intravenous phenobarbitone is required.

Brain infections must be treated promptly and aggressively to obtain good clinical outcome. In the adult, the 3 most common organisms causing bacterial meningitis are pneumococcus, meningococcus and Hemophilus influenzae. Neuroimaging and lumbar puncture should be performed and empirical antibiotics started while awaiting culture results. We recommend intravenous rocephine at a dose of 2g bd. Elderly patients and those who are immunocompromised should additionally receive intravenous ampicillin 2g 4 hourly to cover for Listerosis. TB meningitis is another emergency leading to 100% mortality if untreated and severe neurological deficits if treatment is delayed. It has a subacute onset and patients may present with cranial nerve involvement, focal deficits, hydrocephalus and myelopathy. Cryptococosis must be excluded by negative torula smears and cryptococcal antigen in the cerebrospinal fluid. Pharmacotherapy for TB meningitis includes rifampicin, isoniazid and pyrazinamide.

Guillain-Barre syndrome is an acute inflammatory polyneuropathy which presents with ascending flaccid paralysis of all limbs associated with areflexia. The most serious complication of this disease is respiratory decompensation. Myasthenic crisis is an acute weakness of the respiratory and bulbar muscles which require ventilatory assistance. Specific treatment for both diseases includes plasma exchange or intravenous immunoglobulin.

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References

1. Plum F. Coma and related global disturbances of the human conscious state. In: Peter A, ed. Cerebral Cortex, vol 9. New York, Plenum Press. 1991:359-425.

2. National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. NEJM 1995;333:1581-7.

3. Lowenstein DH, Alldredge BK. Status epilepticus. NEJM 1998;14:970-6.

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Updates in the Treatment of Brain Tumours

A Das

The treatment of brain tumours is an exciting area of research. Prior discussing treatment options, several basic aspects about brain tumours require review. Tumours can either originate in the brain as primary brain tumours or metastasise to brain. This discussion will focus on the primary brain tumours, which in world-wide figures have an overall incidence of about 5/100,000 and result in 2-3% of all deaths caused by cancer. In most series world-wide, neuroepithelial tumours account for 40-60% and meningiomas for 18-27% of primary brain tumours. A retrospective survey was performed at the National Neuroscience Institute/Tan Tock Seng Hospital over a 5 year period from 1994 to 1998. Information regarding 655 central nervous system tumours was obtained. Meningiomas were the most common tumour type accounting for 39% of all central nervous system tumours. Neuroepithelial tumours constituted 23% of central nervous system tumours.

Early diagnosis is an important aspect of successful treatment. The ten most common clinical presentations in our patients with brain tumours included headaches, weakness, seizures, reduced visual acuity, lethargy, gait unsteadiness, giddiness, sensory changes, visual field cuts, and ataxia. Headaches are a common neurological complaint and identifying headaches associated with brain tumours can be problematic. In a series of 111 patients with brain tumours, headaches were present in 48%.[1] Most commonly, these headaches were described as the tension type and less commonly as migrainous or other types. Unlike true tension type headaches, brain tumour headaches are worse with bending over. The early morning type headache is uncommon. Nausea or vomiting, an abnormal neurological exam, or a significant change in the prior headache pattern are clues to suggest that a headache may be caused by a brain tumour.

Different tumour types differ in their modalities of treatment and overall prognosis. Meningiomas, the most commonly occurring tumour in Singapore, are generally well encapsulated and can be removed surgically. Some meningiomas are prone to recurrence and may require re-resection and radiation therapy. Astrocytomas, which are the most common subtype of neuroepithelial tumours encountered here, occur with a broad range of histologic differentiation. The well differentiated tumours may be cured by surgery. The higher grade or more malignant astrocytomas usually require a combination of surgery, radiation therapy, and chemotherapy. Astrocytomas are graded based on four variables: nuclear atypia, mitoses, necrosis, and endothelial proliferation. An astrocytoma with one of these variables is graded as II. Tumours with two variables are called grade III or anaplastic astrocytomas, and tumours with three or more variables are grade IV or glioblastoma multiforme. This grading system is important because it predicts prognosis. In general grade II tumours have a better prognisis; median survival for grade III and grade IV tumours is 2 years and 1 year respectively. While the overall survival of patients with grade IV astrocytomas who receive chemotherapy is not prolonged, the proportion of patients living 18 months or longer is increased. Novel treatment modalities include using interstitial chemotherapy with carmustine-impregnated polymer wafers, which in a phase three placebo-controlled study prolonged survival by 8 weeks in patients with high grade astrocytomas. Newer chemotherapeutic drugs include temozolomide, and alkylating agent which demonstrates a 30% response in those patients with recurrent high grade astrocytomas. Gene therapy is a treatment strategy using the transfer of genes to kill cancerous cells, enhance the immune response, or eliminate the blood supply that tumours require for growth. This new technology still requires extensive work to prove its efficacy.

Reference

1. Forsyth PA, Posner JB. Headaches in patients patients with brain tumors: a study of 111 patients. Neurology 1993;43: 1678-82.

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Management of Epilepsy

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Epilepsy is a common disorder in Singapore, occurring in 3.5 to 4.9 per 1000 population. It affects males more than females, Indians more than Malays, and is more common in the young and the elderly. Although 67% of patients with epilepsy do not have a known aetiology, common causes in the remaining 33% are developmental disorders and infection in the young, and strokes and tumours in the elderly. Trauma from road traffic accident is the commonest cause for those between 20 and 50 years old.

By definition, any person who has two or more seizures has epilepsy (excluding those who have recurrent febrile seizures).

Classification of a patient's epileptic syndrome is the key to managing his epilepsy. Epileptic syndromes are classified as partial (focal) or generalised. The specific syndrome is desired after taking into account a patient's seizure semiology (seizure type), the history and examination, and the investigations, most important of which are the CT/MRI and electroencephalogram (EEG). Classification of epileptic syndromes into partial or generalised syndromes is important as the two syndromes respond to different medication / surgical therapy and have different prognosis. In general, partial epilepsies are more difficult to treat and have a worse prognosis.

When do I start treating a patient's seizures?

A patient who presents with a first fit and has a normal physical examination, EEG and CT/MRI has a 20-30% chance of having a second seizure. I generally do not start anti-epileptic medication as the side-effects of the medication outweigh the benefits. Should the patient have an abnormal physical examination, EEG or CT/MRI, his risk of a second seizure increases to 50%. For example, in a patient with a hemispheric stroke who presents with a first fit, I would start him on carbamazepine as he has a 50% chance of a second seizure. However some doctors would still prefer not to start treatment and at present, this issue remains controversial. On the other hand, a patient who already has two seizures has a 70-80% chance of having a third seizure. For this reason, they should be started on anti-epileptic medication.

What is my choice of anti-epileptic medication?

In general, there is a great overlap of anti-epileptic medication and most drugs can be used for both partial and generalised epilepsies. My first choice for partial epilepsy is Carbamazepine, failing which I would use Phenytoin, Valproic Acid, Lamotrigine or even Phenobarbitone. Valproic Acid is a good first choice medication for generalized epilepsy although Carbamazepine, Phenytoin, Lamotrigine and Phenobarbitone can be used when Valproic Acid fails. It is important to note that juvenile myoclonic epilepsy and absence epilepsy are worsened by Phenytoin.

What are the principles of anti-epileptic medication therapy?

Always use monotherapy if possible. Increase the anti-epileptic drug to the maximum. Don't worry about exceeding the therapeutic range; instead increase the drug till clinical side-effects occur or till the seizures are controlled. Should the drug prove unsuccessful or the side-effects intolerable, tail it off gradually and introduce a second anti-epileptic medication. Repeat the procedure as with the first medication. Should the second medication prove unsuccessful, tail it off gradually and introduce a third medication.

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Should the third medication fail, consider dual drug therapy. The combination should include the two drugs (of the original three drugs) which were most effective in controlling the seizures. While it is theoretically correct to have a combination of two drugs based on different modes of action (e.g. sodium channel blocker plus a calcium channel blocker), it often does not follow this rule in practice. We can also consider using a newer anti-epileptic medication (Gabapentin, Topiramate, Vigabatrin) as the second medication in dual drug therapy (eg Carbamazepine plus Gabapentin) if the original dual therapy is unsuccessful.

How effective is drug therapy?

50% of patients respond to the first anti-epileptic medication. Another 20-30% respond to the second monotherapy medication when the first medication has failed. In total, about 70% of patient with epilepsy can be effectively controlled on monotherapy. Another 10% respond to dual/triple drug therapy, giving a total response rate of 80%. The remaining 20% are patients with refractory epilepsy as there is no effective drug therapy. These patients are considered for surgery and vagal nerve stimulation.

Patients are usually treated till they have been fit free for two years. Withdrawal of medication after 2 years results in 66% of patients remaining seizure-free but 33% have seizure recurrence. Patients with an abnormal CT/MRI or EEG, or have a seizure onset before two years of age, or have more than 30 generalized tonic-clonic seizures are more likely to have seizure recurrence. When seizure recurrence does occur, reinstate anti-epileptic medication. The response rate remains unaffected and it may be worthwhile to attempt withdrawal again after two years of therapy.

Certain epileptic syndromes like juvenile myoclonic epilepsy have a high recurrence rate upon discontinuation of medication and it is worthwhile to keep these patients on medication for more than two years.

How do I discontinue anti-epileptic therapy?

I slowly tail off the anti-epileptic medication over a period of six months. The general philosophy is to tail off the therapy in as short a period as possible without risking a seizure recurrence. Trials over 6 weeks and 9 months regarding discontinuation of therapy have shown similar rates of seizure recurrence. I take a moderate stand, using six months as a guiding rule.

What are the forms of therapy besides medication?

20% of patients with epilepsy remain refractory to medication. They can be offered surgery, vagal nerve stimulation, acupuncture and ketogenic diets (in children only). Eligibility criteria for surgery include :

1. medically intractable seizures even with two years of supervised therapy
2. partial seizures
3. no history of psychosis or mental retardation and
4. no evidence of a progressive disease.

Patients with mesial temporal lobe epilepsy are notoriously difficult to treat with medication but respond well to temporal lobectomy. For this reason, these patients should be diagnosed early and assessed for surgery.

In conclusion, epilepsy is a common disorder in Singapore. The key to managing epilepsy lies in the correct classification of the epileptic syndrome. Epilepsy remains a gratifying condition to treat as 80% of patients respond to medical therapy. Of the remaining 20%, surgery offers a cure for some, especially in patients with mesial temporal lobe epilepsy.

The Singapore Family Physician

Excessive Daytime Sleepiness

N K Loh

Excessive daytime sleepiness is a common problem, occurring in 5% of the population. Its clinical significance is illustrated in the 25% of drivers who have fallen asleep while driving, the 20% of shift workers who have sustained job related accidents and the learning disabilities encountered by children.

The approach to a patient with excessive daytime sleepiness is to diagnose those patients with treatable causes.

These causes include: 1. Sleep deprivation (commonest) 2. Sleep apnea syndrome 3. Narcolepsy 4. Periodic limb movement disorder 5. Stimulant withdrawal 6. Hypnotics/sedatives and 7. Psychiatric conditions. Other causes like idiopathic hypersomnia and periodic hypersomnia do not respond so well to treatment.

I find certain symptoms useful in guiding me to a diagnosis. These include :

Symptom	Diagnosis
a. Very loud snoring	Sleep apnea
b. Nap dreaming	Narcolepsy
c. Cataplexy (sudden loss of tone following an emotional outburst)	Narcolepsy
d. Unrefreshing naps	Idiopathic hypersomnia
e. Intermittent sleepiness	Periodic hypersomnia (eg Kleine-Levin syndrome)

Other than sleep deprivation, sleep apnea syndrome is the commonest cause of excessive daytime sleepiness. 80%-90% of patients studied in our sleep laboratories with a polysomnogram (PSG) are diagnosed to have **obstructive sleep apnea (OSA)**, the commonest of the sleep apnea syndromes.

The typical OSA patient is an obese male between 40-60 years old with a history of loud snoring and occasional witnessed apneas (choking episodes). His main complaints are:
1. Excessive daytime sleepiness
2. Morning headaches or
3. Poor quality sleep of his spouse (woken up frequently by his snoring!).

It is important to note that the severity of snoring is not proportional to the severity of OSA. In fact, during severe phases of airflow obstruction especially during rapid eye movement (REM) sleep, snoring may be absent. Patient with untreated OSA may develop :
1. Hypertension
2. Pulmonary hypertension because of hypoxia from apneas
3. Acute myocardial infarction
4. Cardiac arthythmias
5. Strokes and
6. Sudden deaths

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Therefore, it is imperative that OSA be diagnosed early and treated urgently. Diagnosis of OSA is both clinical and laboratory - based, the PSG being the most important investigative tool. During a PSG, we are able to conclude if a patient suffers form apneas and whether these apneas are obstructive in nature. Severity of the OSA, based on the apnea-hypopnea count, is also determined on the PSG.

Treatment of OSA includes reducing weight, smoking and alcohol intake, as well as treating underlying causes like hypothyroidism and acromegaly. The definitive treatment for OSA is continuous positive air way pressure (CPAP). This involves delivering a positive pressure to the patient's airways via a mask every night and is meant to keep the airways patent during sleep. Treatment is effective and alleviates symptoms. Problems of chronic CPAP usage include : a) Facial abrasion b) Dry nose/mouth c) Tolerance (70%) and d) Non-compliance (30-40%). Surgical operations, like uvulo-palato-pharyagoplasty are useful for mild or moderate OSA but not for severe OSA as it only reduces the apnea and hypopnoeas by 50% on the average.

Narcolepsy is the next commonest cause of excessive daytime sleepiness, occurring once in every 4,000 of the population. It affects both males and females equally, with the onset in the second and third decade.

The typical narcoleptic patient complains of excessive sleepiness with sudden sleep attacks, sleep paralysis and episodic weakness precipitated by emotion (laughter/excitement). These episodes of weakness are termed cataplexy and narcolepsy is the only sleep disorder they are associated with (10-15% of narcoleptics). These attacks occur several times a day and involves sagging of the face, eyelids or jaw, dysarthria, head dropping and buckling of knees. Actual falls are rare and consciousness is preserved except in prolonged episodes.

Sleep paralysis consists of episodes lasting a few seconds to a few minutes of inability to move during sleep onset or upon awakening (cannot even lift a finger). The patient complains of a sensation of struggling to move and may have bizarre hypnagogic / hypnopompic hallucinations (visual, auditory, tactile).

Diagnosis of narcolepsy is based on the clinical features of : 1. Excessive daytime sleepiness with sleep attacks 2. Cataplexy 3. Sleep paralysis and 4. Multiple sleep latency test showing a mean sleep onset of fewer than 5 minutes with two episodes of sleep-onset REM periods.

Complications of narcolepsy include driving-related (67%) and work-related (80%) accidents and depression. Treatment involves : a) Education and counselling b) Sleep hygiene c) Drug therapy for sleepiness (methylphenidate, pemoline, amphetamines), cataplexy (tricyclic anti-depressants), hallucinations (tricyclic anti-depressants) and sleep disturbance (sleep hygiene, short acting hypnotic) and d) Discussion of related issues like driving, working and transmission of disease to offspring (HLA-DR2).

Periodic limb movement disorder (PLMD) is another common cause of daytime sleepiness. These patients, usually in their fifties, have involuntary, periodic leg jerks during sleep and suffer from poor quality sleep with resultant hypersomnia. Each leg jerk lasts 0.5 to 5 seconds and recurs at intervals of 5-90 seconds.

Causes of PLMD include :
1. Iron deficiency anaemia
2. Folate deficiency
3. Hypothyroidism
4. Chronic renal failure
5. Peripheral neuropathy
6. Parkinson's disease and
7. Drugs like caffeine, neuroleptics, L-Dops, tricyclic anti-depressants, barbiturates, sedatives, narcotics and lithium.

Investigations include :
a. Full blood count
b. Urea/electrolytes/sugar/ureatinine
c. Iron/folate/Vit B12
d. Electromyography (EMG).

Diagnosis of PLMD is by a PSG, whereby leg jerks are diagnosed and quantitated. Restless leg syndrome, a condition charcterised by an uncomfortable, unpleasant crawling sensation in both legs (asymmetrical and alternating) and an irresistible urge to move, is associated with PLMD.

Treatment of PLMD is both effective and gratifying. It includes :
a. Clonazepam
b. Sinemet, Madopar
c. Opoids and
d. Carbamazepine.

Occasionally, PLMD is associated with OSA and clonazepam would aggravate the latter. Other causes of excessive daytime sleepiness like stimulant withdrawal, hypnotics/sedative and psychiatric conditions are usually diagnosed on history and they are best managed by the psychiatrist.

In conclusion, sleep medicine is an emerging and exciting field. Common sleep disorders like obstructive sleep apnea, narcolepsy and periodic limb movement disorder are readily diagnosed and effectively treated. For the majority of patients, this represents a dramatic and significant improvement in their lifestyles.

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Interventional Neuroradiology

F Hui

Interventional neuroradiology involves the endovascular approach in treating vascular diseases of the head and spine. A puncture is made in the femoral artery and using the arterial system as a road map, a catheter or microcatheter(a very small catheter) is manipulated into the intracranial circulation, close to the site of pathology. From there, the radiologist can introduce agents such as particles, liquid adhesives, balloons or drugs through the microcatheter to bring about the required effect.

The endovascular approach can be used to treat certain neurovascular conditions. In these instances, embolisation confers obvious benefits. The patient is spared a large operative scar in the skull, face or spine. Post procedure pain is also greatly reduced and the patient eventually incurs reduced cost for a less invasive procedure. For example, in patients with caroticocavernous fistulae, embolisation is the treatment of choice. These lesions can be treated successfully by balloons, coils or glue with preservation of the blood flow in the internal carotid artery. Apart from these benefits to the patient, there are also advantages to the health service in the form of shorter hospital stay and less intensive care management.

Advances in endovascular techniques and equipment have made interventional neuroradiology increasingly helpful in the treatment of brain and spinal lesions. Management of intracranial and spinal arteriovenous malformations in particular has benefited much from embolisation, either as a pre operative or pre radiosurgical procedure or as the sole form of treatment.

Complete obliteration of brain arteriovenous malformations (AVMs) can be achieved by embolication alone in 7 to 11.2% of cases(1,2). Obviously, the embolic material used must be able to penetrate the site of shunting and be permanent so that the embolised vessels will not recanalise. In a study of 12 patients who had complete occlusion of their AVMs by N-butyl cyanoacrylate (NBCA) glue, Wikholm[2] found no evidence of recanalisation of the AVM in follow up angiograms performed 4 to 78 months post embolisation.

For patients with large vascular meningiomas, pre operative embolisation has been shown to result in less complications from reduced blood loss at surgery and shorter operating time[3]. Other intracranial and extracranial tumours which are richly supplied by pathological vessels can also be excised with less morbidity after preoperative embolisation.

Interventional neuroradiology has enhanced the treatment of cerebrovascular diseases. Rapid improvements in catheter designs and embolic material will enable further progress in this field.

References :

1. Fernando Vinuela. Functional evaluation and embolization of intracranial arteriovenous malformations. In Interventional Neuroradiology. Endovascular therapy of the central Nervous System. 1992 Raven Press, New York.

2. Wikholm G. Occlusion of cerebral arteriovenous malformation with N-ButyI Cyanoacrylate is permanent. AJNR 1995;16:479-82.

3. Bruce L.D., Flom R.A., Wallace R.C. et al. Efficacy of endovascular treatment of meningiomas: Evaluation with matched samples. AJNR 1994;15:1675-80.

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Quiz

Test Your Eye-Q (No. 6)

Unilateral Chronic Red Eye

KG Au Eong, S B Lee***

A 43-year-old myopic woman complained of redness and discharge in her right eye for 3 months. She has been treated with many different eye drops from several doctors without improvement. She gave a history of a sudden decrease in vision after she was punched in the eye 7 years ago. She underwent an operation to treat her decreased vision.

Questions

1. What does Fig. 1 show?
2. What is the cause of the patient's chronic red eye?
3. What operation was done for the patient previously?
4. What is the likely cause of the patient's decreased vision previously?
5. What is the present treatment for the patient?

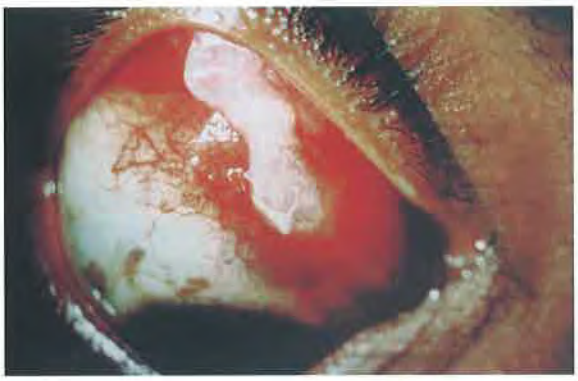

Fig. 1 shows the anterior segment of her eye.

Answers

1. Fig. 1 shows an exposed silicone scleral explant with surrounding conjunctival hyperaemia and mucopurulent discharge.

2. The cause of the patient's chronic conjunctivitis is the exposed scleral explant.

3. A scleral buckling operation was done for the patient. Scleral buckling involves stitching silicone sponges, tyres or bands (called explant) onto the sclera to indent the sclera to treat a retinal detachment.

4. The patient's decreased vision was due to a retinal detachment secondary to ocular trauma. Her myopia also predisposed her to retinal detachment.

5. The patient's chronic conjunctivitis is likely to persist until and unless the conjunctiva heals. This may be facilitated by surgical removal of the exposed scleral explant. However, if the retinal re-attachment operation was recent and the presence of the scleral buckle is crucial to the success of the operation, the conjunctiva may be closed over the explant by direct closure or with a conjunctival graft taken from another part of the same eye or from the fellow eye. Topical antibiotic eyedrops should be given until the conjunctiva heals.

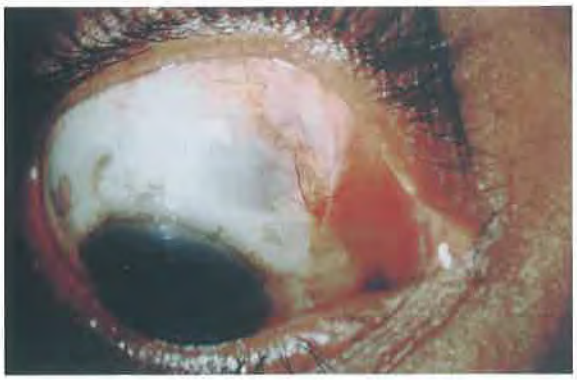

Fig. 2 shows the same eye several weeks after the scleral buckle has been removed. The conjunctiva has healed and the eye is no longer inflamed.

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Book Review

Professional Development In General Practice

Oxford General Practice Series ***Pendleton / Hasler 1997***

While continuing medical education (CME) for doctors is highly encouraged, the professional development of doctors is not often mentioned. Traditional CME concentrates on the updating and increasing of knowledge rather than the acquisition of new skills. This is an area the authors find CME deficient in. Current CME programmes no longer meet the needs of family physicians who will be playing a pivotal role in an era where primary medical care is gaining prominence and the population is getting more sophisticated. Pains are taken to explain the need for the professional development of doctors and practice, with the authors elaborating on the important differences between the academic and the professional approaches to medical education.

Pendleton and Hasler draw from their vast experience in the areas of practice, lecturing and keen observation and provide an excellent overview in this compact book. Readers will find a wealth of information on the strategies and activities that will enhance the professional development of doctors. Case studies, tables, line charts and action plans have been included to illustrate the activities to put them in better focus. Some of these activities include improving consultation skills, joint consultation with specialists, use of a facilitator, peer review through practice visits, portfolio-based learning, quality improvement, GP mentors and specialty liaison groups.

Some of us would have recognised that some of these activities are already in place, but are mostly adopted by doctors undergoing post-graduate medical training. This means that the majority of doctors will never be involved in most of the activities that will enhance their professional development. It is not only a question of time and resources, but a question of one's discipline and commitment as well to maintain and complete the desired activity. Doctors and their practices must set their goals realistically and implement the activities that will suit their requirements optimally. To embark on professional development programmes that will reach out to all doctors will imply a need for a coordinating body. The absence of this has been acknowledged and the authors have suggested the concept of professional development consultancy services (PDCS) that can undertake the job of providing guidance for professional development. The concept of a PDCS is something our local medical professional body must take a hard look at if we are to take professional development seriously.

Change and development have been the key themes in this book. Change is required in medical practice as one responds to the patient who will have more access to information and will play an increasingly important role in the decision-making process. As we approach a knowledge-based economy in the new millennium, the need to stay relevant has never been greater. To paraphrase the authors, that unless we upgrade and embrace the future with enthusiasm, the family physicians' livelihood is no longer automatically assured.

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The Singapore Family Physician

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Authors are invited to submit articles for publication in ***The Singapore Family Physician*** on the understanding that the work is original and that it has not been submitted or published elsewhere.

The following types of articles may be suitable for publication: case reports, original research, audits of patient care, protocols for patient or practice management and review articles.

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- Normally the text should not exceed 2000 words and the number of illustrations should not exceed eight.
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- **Results**: Present results in logical sequence in the text, table and illustrations.
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