Common neurological diseases

**Introduction**

The brain, spinal cord and peripheral nerves constitute an organ responsible for perception of the environment, a person’s behavior within it, and the maintenance of the body’s internal environment in readiness for this behavior. It is estimated that one fifth of acute medical emergencies and large proportion of chronic physical Disability is related to neurological disorders.

A carefully taken history of the pattern of presenting neurological symptoms should suggest a short list of diagnoses that can then be tested on examination. During the neurological examination, knowledge of the relevant anatomy and physiology of the nervous system helps to determine the site of the lesion. The underlying pathology is often suggested by the time course of the symptoms and the epidemiological context. Increasingly sophisticated investigations, particularly imaging, are available to clarify this clinical diagnosis.

**Investigation of neurological disorders**

Apart from the general investigation, there are more specific investigation that are directly related to neurological disorders:

**1- Electroencephalography**

The electroencephalogram (EEG) is used to detect electrical activity arising in the cerebral cortex. It is useful in the investigation of patients who have disturbance of consciousness or disorders of sleep, in the diagnosis of cerebral diseases such as encephalitis.

**2- Nerve conduction studies**

The principal use of NCS is to identify damage to peripheral nerves, and to determine whether the pathological process is focal or diffuse.

**3- Electromyography**

**4- Neuroimaging**

(plain X-rays, computed tomography (CT), CT angiography, magnetic resonance (MR imaging MRI,

ultrasound, and radioisotopes.

**5- Lumbar puncture**

Lumbar puncture is indicated in the investigation of infections (meningitis or encephalitis), subarachnoid haemorrhage, inflammatory conditions (multiple sclerosis).

**Common presentation of neurological diseases**

**Loss of consciousness**

Although loss of consciousness is relatively a common presenting feature of neurological disease, many other causes can lead to loss of consciousness, these include:

1. Simple faint.

2. Diabetic collapse from hypoglycemia.

3. CVA (stroke).

4. Epileptic seizure.

5. Anaphylaxis.

6. Cardiac arrest.

7. Adrenal crisis.

8. Cardiac arrhythmia or circulatory obstruction (aortic stenosis).

*Syncope is defined as transient LOC results from reduced cerebral blood ﬂow.*

**Simple faint**

It is syncope associated with loss of postural tone followed by spontaneous recovery. Sometimes occurs before or during dental treatment especially before, during and after injections.

**Clinical feature**

Vasovagal attack in young adult usually due to;

- prolonged standing - anxiety - pain

- fatigue - fasting - high temperature

The condition is characterized by sweating,nausea, pallor, weakness, cold clammy skin, dilated pupils, rapid pulseand loss of consciousness followed by rapid recovery on lying down, otherwise the patientmay have seizure.

**Cerebrovascular accident (CVA)**

Stroke or cerebrovascular accident (CVA) is acute brain damage due to ischemic infarction or cerebral bleeding.

**Causes**

1- Ischemic CVA: due to thrombotic or embolic occlusion of a cerebral artery.

2- Hemorrhage CVA: due to tumor, vascular malformation, trauma.

**Risk factors**

- Hypertension - age - DM - smoking - hyperlipidemia

- obesity - atrial fibrillation - valvular heart disease

**Clinical features**

Disturbed consciousness unilateral hemiplegia (flaccid then spastic weak arm and leg) sensory loss visual ﬁeld defect

Dysphasia facial palsy.

Sudden coma and death are common presentations.

Transient ischemic attack (TIA) is defined as temporary disruption in the blood supply to part of the brain, presented with symptoms similar to typical CVA, but symptom resolve in <24 h. It should be considered as a warning sign for development of CVA in the future.

**Investigation**

CT scan and MRI to localize cerebral damage and assess the severity.

ECG, echocardiography and ultrasound of carotid artery.

Cerebral angiography to localize the source of hemorrhage.

**Treatment**

1- insert intravenous line.

2- correct blood pressure, blood glucose, and other vital signs.

3- consider fibrinolytic therapy.

4- antiplatelet, anticoagulant if necessary.

5- control CNS bleeding if present.

**Dental aspects**

The following conditions should be kept in consideration:

- impaired communication - associated diseases - medications

- bleeding tendency - loss of protective swallowing and gag reﬂexes

- risk of sudden loss of consciousness during dental surgery.

Defer elective and invasive dental care for 3-6 months.

Blood pressure monitoring and careful drug history are essential before preceding dental procedure.

The patient should be kept in upright position to avoid foreign bodies from entering the pharynx.

Good suction must be at hand.

Calciﬁed atherosclerotic plaques may sometimes be detected on dental panoramic radiographs.

Drugs:

Avoid opioids and benzodiazepines (risk of respiratory depression).

Avoid adrenaline-containing gingival retraction cords.

**Parkinson disease (Paralysis agitans)**

Parkinson’s disease is a neurodegenerative condition which affects the basal ganglia and which presents with differing combinations of:

1- slowness of movement (bradykinesia),

2- increased tone (rigidity)

3- tremor and loss of postural reflexes.

**Causes**

CVA head injury encephalitis toxins (pesticides, carbon monoxide)

low estrogen levels (menopause) antipsychotic drugs and other drugs (e. g. metoclopramide)

Parkinsonism is the term used for similar syndrome resulted from use of drugs.

**Clinical features**

Patient above 50 years with resting tremor, rigidity, bradykinesia (slow movements), drooling of saliva, and expressionless face (mask face).

**Treatment**

L-dopa , Dopamine agonists (bromocriptine), and Anticholinergics to reduce the tremor.

Deep brain stimulation (DBS) pacemaker.

**Dental aspects**

Adrenaline increases tremor, which affect the tongue and/or lips.

Tremor, drooling of saliva and head positioning make the use of sharp rotating instruments hazardous and compromise restorative care.

Drugs:

L-dopa may interact with adrenaline causing tachycardia, arrhythmias and hypertension; therefore, LA Without adrenaline should be used.

Do not stop anti-Parkinson medication.

Drooling of saliva may be treated with botulinum toxoid injection into salivary glands to decrease salivation.

Orofacial involuntary movements (dyskinesia), such as ‘ﬂycatcher tongue’ and lip-pursing, are side effects of L-dopa and bromocriptine.

L-dopa may cause taste disturbances and red saliva.

Antimuscarinic drugs may produce dry mouth.

**Epilepsy**

A seizure is any clinical event caused by an abnormal electrical discharge in the brain, whilst epilepsy is the tendency to have recurrent seizures.

**Causes of seizures**

1- epilepsy

2- sudden increase or decrease in temperature

3- hypoglycemia, alcohol and drug intoxication or Withdrawal

4- brain injury,

5- neoplasia, congenital disease, HIV, and CVA.

**Types**

A- Generalized seizures: presented as tonic- clonic (grand mal), absence (petit mal), myoclonic, or atonic types.

B- Partial seizures (localized to certain part of the brain) presented as localized motor or sensory symptoms, or psychomotor types.

**Clinical features**

Young adult with history of precipitations for seizure (e.g. fasting, stopping anticonvulsant therapy, menstruation, alcohol, or taking antidepressant medication).

*The attack of Tonic-clonic seizures occurs in 4 phases:*

1- prodromal (aura) phase (mood or behavioral changes like crying).

2- tonic phase characterized by loss of consciousness and generalized tonic spasm (rigid extended position) for < 1 min.

3- clonic phase characterized by repetitive jerking movements of the trunk and limbs, tongue-biting, and urinary and/or fecal incontinence, lasting for few minutes.

4- post- ictal recovery phase of headache, confusion or sleepiness.

The most important distinguishing feature of an epileptic fit is the post ictal phase because all the 3 other phases might be absent.

Status epilepticus is defined as a seizure or a series of seizures lasting 30 minutes without the patient regaining awareness between attacks. Most commonly, this refers to recurrent tonic clonic seizures (major status) and is a life-threatening medical emergency.

*Absence seizure*

presents with sudden temporary arrest of movement, speech and attention, followed by recovery when the patient carries on what he was doing.

*Myoclonic type*

presents with sudden jerking movement.

*Atonic type*

presents with sudden fall to the ground with or without loss of consciousness.

**Investigation**

- After a first seizure, immediate cerebral imaging with CT or MRI is advisable, particularly in patients aged over 20 years, to exclude structural abnormality in the brain.

- The EEG may help to establish a diagnosis and characterize the type of epilepsy. But it should be kept in mind that normal EEG does not exclude epilepsy.

- • Urea and electrolytes

 • Liver function tests

 • Blood glucose

 • Serum calcium, magnesium

**Treatment**

Antiepileptic drugs include GABA agonist and neuronal inhibitors like sodium valproate, carbamazepine, phenytoin, and gabapentin.

Surgery (VNS - vagal nerve stimulation)

**Dental aspects**

Consider precipitations of the ﬁts (drugs, fatigue, starvation, stress, and infection)

Consider associated handicaps (e. g. learning impairment), psychiatric disorders, craniofacial complications (lacerations, hematomas, fractures, TMJ subluxation, or lacerations or scarring of tongue, lips or buccal mucosa)).

Drugs:

Nitrous oxide can cause CNS depression if combined with anticonvulsants.

Avoid antidepressants, metronidazole, tramadol, erythromycin, doxycycline, NSAIDs, aspirin and quinolones.

Consider phenytoin side effects: thickened facial features, hypertrichosis, cervical lymphadenopathy, allergy, SLE like reaction, erythema multiforme, gingival swelling, dental anomalies, anemia, ataxia, and nystagrnus

Benzodiazepines are safe but ﬁts can occur with midazolam.

Other anticonvulsants with oral side effects:

Dry mouth: Carbamazepine, Gabapentin,

Dyskinesia: Carbamazepine

**Febrile convulsions (febrile seizures)**

Sudden loss of consciousness and seizures of < 2 minutes in young children resulted from sudden reduction or elevation of body temperature (above 38°C) commonly due to infection.

**Treatment**

Bath with tepid water and paracetamol (not aspirin).

Children less than 18 months need hospitalization since fit may be due to meningitis.

**Dementia V**

It is chronic progressive deterioration of mental function characterized by impaired cognition (memory, concentration and orientation), language, mood, behavior, intelligence, and insight with intact consciousness.

**Causes**

Alzheimer's disease vascular or multi-infarct dementia

Multiple sclerosis Parkinson's disease

endocrine diseases hepatic failure, renal failure

vitamin deﬁciency (e. g. thiamine in alcoholics) CNS infections (e.g. syphilis).

Oral neglect is typical and despite the need for dental care, patients are often unable to cooperate with treatment under LA.

**Alzheimer dementia**

A medical condition characterized by global atrophy of the brain, lost short-term memory, deteriorated intellect and personality.

**Investigation**

CT scan or MRI show brain atrophy.

**Treatment**

Drugs to stabilize acetylcholine levels (donepezil) and glutamate antagonist (memantine).

**Dental care**

Dental appointments and instructions are usually forgotten.

Neglecting oral health (teeth brushing and denture care).

Hyposalivation can lead to caries, periodontal disease, eating difficulty, so that salivary substitutes may be of help.

Loss of taste is common.

Explain every procedure before it is carried out.

Avoid time-consuming and complex treatments.

Preoperative sedation with short-acting benzodiazepine may be required.

**Multiple sclerosis (MS)**

It is immunologically mediated disorder in young adults, characterized by demyelination plaques in the CNS with involvement of cranial nerves resulting in visual defects, sensory deﬁcits, trigeminal

neuralgia, or facial paralysis.

Remissions are common, but with eventual disability.

**Investigation**

MRI shows demyelination plaques

**Treatment**

Corticosteroids or interferon may help.

**Peripheral neuropathy**

Generalized inﬂammation of peripheral nerves (sensory, motor, or autonomic).

**Causes**

DM renal failure drugs (isoniazid, metronidazole)

cobalamin (B 12) deﬁciency pyridoxine (B6) deﬁciency thiamine (B1) deﬁciency

**Dental aspects**

Polyneuropathy can cause pain, numbness, or tingling of mouth, face, and extremities.

Consider associated problems from the causes of polyneuropathy.

Consider problem related to dry mouth, postural hypotension, and gastroparesis leading to delayed gastric emptying and regurgitation of acidic gastric contents and dental erosions.

**Cerebral palsy**

It is cerebral damage around the time of birth due to hypoxia manifesting with disordered movement, spastic or ﬂaccid posture, and there may be associated learning disability, epilepsy, and disturbed vision, hearing, speech, or emotions.

There is no effective treatment.

**Dental aspects**

There may be swallowing problems, drooling of saliva, TMJ subluxation, malocclusion, or difficult manual dexterity leading to poor oral hygiene.

It is autosomal dominant disease affecting middle age group and presented with progressive dementia and irregular dance-like involuntary movements.

There is no effective treatment with poor prognosis.

Oral hygiene is often poor and patients often sustain facial injuries from

frequent falls.

**Spina biﬁda**

It is neural tube defect associated with folic acid deﬁciency during pregnancy.

Myelomeningocele is the most severe form and may be associated with paraplegia, fecal and/or urinary incontinence, meningitis and, brain abnormalities.

There is no effective treatment.

Patients often have latex allergy.

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