DR MARITIM'S GUIDE TO NEUROLOGY

(I) GENERAL HISTORY TAKING

Biodata - Name
- Age
- Gender
- Residence
- Occupation
- Handedness

Presenting Complaint - in patient's own words in chronological order with oldest complaint first

History of Presenting Illness

Past Medical History

Obstetrics/ Gynaecologic History

Family and Social History

Systemic Enquiry

Summary

Physical Examination
- -General Examination including Vital Signs
- -Systemic Examination
  - -Respiratory System
  - -Cardiovascular System
  - -Per Abdomen
  - -Neurologic Exam

Diagnostic Formulation

(II) NEUROLOGIC HISTORY

- Biodata – Age , gender, Handedness, Occupation
  -Handedness – Left hemisphere contains language in almost all right handed individuals and in 70% of patients who are left handed or ambidextrous.
- PCO
- HPI – including neurological screening questions.
- PMHx
- Drug Hx
- Family and Social Hx

PCO

Nature of complaint
- Headache
- Seizures

- Loss of consciousness
- Behavioural abnormalities
- Visual disturbances
- Vertigo
- Speech disorders
- Weakness of limbs
- Sensory disturbances
- Unsteady gait
- Abnormal movements
- Syncope

HPI

The Nature of the Complaint – Ensure to understand what the patient is describing eg when a patient says his vision is blurred he may mean it is double, dizziness may mean vertigo, a weak limb with no altered sensation may be referred to as numb.

The Time Course of complaint

-**Onset** – sudden? (**VASCULAR, EPILEPTIC**)
- over a few minutes? (**VASCULAR, EPILEPTIC, MIGRANOUS**)
- over a few hours? (**VASCULAR, EPILEPTIC, MIGRANOUS**)
- over a few days? (**INFLAMMATORY, INFECTIVE**) ,
- over a few weeks?(**NEOPLASTIC, VASCULAR**)
- over a few months?(**INFLAMMATORY, INFECTIVE, NEOPLASTIC**)
- Over a few years?(**DEGENERATIVE, GENETIC, CONGENITAL**)

-**Progression** – Is it Continous or Intermittent?
-any improvement, stabilization or progression?

-**The pattern**: If Intermittent, what was the duration and the frequency?

Precipitating or Relieving Factors

Previous Treatments and Investigations

The Current Neurological State – ie current functional abilities

Screen for other neurological symptoms

-Headaches, fits, episodes of numbness, tingling sensations

-Weakness

-Sphincter disturbances – urinary incontinence, fecal incontinence , urinary retention, fecal retention (constipation)

-Visual symptoms – double vision, blurred vision, loss of sight

(III) SEQUENCE AND TECHNIQUE OF NEUROLOGIC EXAMINATION

A. Assessment of Higher Functions

- Level of consciousness using Glasgow Coma Scale
- Orientation in Time, Place and Person

- Intelligence
- Memory
- Speech
- Concentration/Calculation/Attention – serial subtraction of seven

Dominant Hemisphere – Language

Non- Dominant Hemisphere

Sensory Interpretation

Graphaesthesia- patient to identify letter or number written on the palm

Stereognosis- patient to name an object placed on the palm

Neglect- Patient may eat food only on the right side of a plate, fail to groom the left side of the body..

- ***Spatial orientation*** – Approach the patient on the weak side and call out quietly, patient searches on the wrong side. Repeat by approaching from the good side.
- ***Double stimulation*** – Touch on one hand and then the other and then both. Repeat with eyes closed and ask patient to identify as right , left or both.
- ***Clockface exercise***
- ***Reading, writing***
- ***Ideomotor apraxia***- Ask patient to manipulate some familiar object such to dial a phone or hold a pencil in the position of writing

B. Head, Neck and Spine

Head and orifices – nose, ears, eyes, mouth; Head circumference in children

Neck Examination – Neck soft or stiff, Kernig's sign, Brudzinki's sign

Spine Examination – curvature, scoliosis, kyphosis, kyphoscoliosis, gibbus deformity, hair tufts, swellings, dimpling.

C. Cranial Nerves

From I- XII

D. Motor System

Sequence of motor system exam - Bulk, Tone, Power, Reflexes

Muscle bulk

Muscle bulk, atrophy, fasciculations

Muscle tone

Muscle tone – resistance of muscle to passive movement at a joint. Tone can be normal, increased or decreased.

Muscle power

Muscle power – Measured by the ability to contract the muscle against force or gravity. Graded from 0-5 in the MRC grading.

0 -No contraction/ Complete paralysis

1- Flicker of movement

2 -Movement if gravity is eliminated

3- Movement against gravity

4- Movement against gravity and resistance

5- Normal strength

Reflexes

Reflexes – Deep tendon reflexes(DTR) and superficial reflexes

DTR – A deep tendon reflex is the reaction of a muscle to being passively stretched by percussion on the tendon.

Graded from 0-4

0 - Absent

1 – Present (as an ankle jerk)

2 –Brisk (as a knee jerk)

3 – Very brisk

4 – Clonus

Nerve Roots

Jaw Jerk – mid pons

Biceps Reflex (C5,6)

Triceps Reflex (C6,7)

Supinator Jerk (Brachioradialis Reflex) (C5,6)

Quadriceps Reflex (Knee Jerk) (L2,3,4)

Ankle Jerk (Achilles Reflex) (S1,2)

Jendrassik's manouvre is used to reinforce the reflexes – for upper limb examination, patient asked to clench teeth, for lower limbs patient asked to hook the fingers of both hands together and pull them apart as strongly as possible.

Superficial reflexes

- ***Plantar response/ reflex*** – Extensor plantar response seen in corticospinal tract lesions (Upper motor neuron lesions)
- ***Superficial abdominal reflex*** – Absence of this results from corticospinal lesion. The reflex is absent ipsilateral to hemiparesis/ plegia.

Others

Cremasteric reflex

Anal wink

Primitive Reflexes

Grasp sign

Suck sign

Snout sign

Glabellar sign

E. <u>Sensory System</u>

Modalities of sensation assessed include ***pain, temperature***(spinothalamic), light ***touch***(relayed in both spinothalamic and posterior column) ***joint position sense and vibration sense*** (posterior column)

- Pain – pin prick

- Temperature – test tubes with cold and warm water
- Touch – wisp of cotton-wool
- Joint position sense – big toe
- Vibration sense – Tuning fork of 128 Hz frequency

Tested distally from the toes and in an ascending manner following the dermatomes. Any sensory level is defined by the dermatome involved.

F. **Motor coordination (Cerebellum)**

Finger- nose test
Rapid alternating movements
Rebound
Heel-shin test
Titubations
Truncal ataxia
Scanning speech
Nystagmus
Hypotonia
Pendular reflexes

G. **Gait**

- Steppage gait – in peripheral neuropathy
- Cerebellar gait
- Sensory – ataxic gait – high steps and slapping down of the feet seen in tabes dorsalis. Eyes are glued to the ground.
- Hemiplegic gait
- Paraplegic gait – scissoring due to increased adductor tone. Seen in myelopathy or bilateral coticospinal tract disease.
- Dystrophic gait – waddling and lordotic posture from pelvic muscle weakness.
- Parkinsonian gait
- Antalgic gait – painful limping gait

(IV) FORMULATING THE DIAGNOSIS

A comprehensive diagnosis of a neurological disorder should be able to indicate the following 4 facets:-

- ***Clinical presentation***
- ***Anatomical localisation***
- ***Aetiological nature***
- ***Pathological process underlying the disorder***

Eg. A man with **left sided spastic hemiplegia** (clinical presentation) due to an **embolism** (aetiological nature) in the **middle cerebral artery territory** (anatomical site) as a complication of **mitral stenosis with atrial fibrillation** (pathological process)

Questions to answer:

What is the anatomy? PNS, NMJ, SC, Brain stem?
What is the pathologic process/ pathophysiologic process?

- Infection – acute, subacute, chronic
- Inflammatory process
- Cerebrovascular accident – ischemic, hemorrhagic
- Trauma related
- Tumour
- Metabolic
- Neuro-degenerative
- Congenital
- Psychogenic

Signs of upper motor neuron lesions

- Weakness or paralysis
- Increased muscle tone (spasticity)
- Increased deep tendon reflexes
- Extensor plantar response
- Loss of superficial abdominal reflexes
- Little ,if ,any muscle atrophy

Signs of lower motor neuron lesions

- Weakness or paralysis
- Wasting and fasciculations of involved muscles
- Hypotonia (flaccidity)
- Loss of deep tendon reflexes when neurons subserving them are affected
- Normal abdominal and plantar reflexes – unless the neurons subserving them are directly involved, in which case reflex responses are lost.

Little if any muscle atrophy

(VI) INVESTIGATIONS

Radiologic – Plain radiographs, CT scans , Magnetic Resonance Imaging/Magnetic Resonance Angiography(MRI/MRA)
Angiography
CSF examination
Electromyography
Electroencephalography
Ultrasonography
Biopsies