MYASTHENIA GRAVIS
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DEFINITION:
Myasthenia gravis is an autoimmune disease associated with antibodies to
the acetylcholine receptors and rarely anti striated antibodies. It is associated
with painless weakness or fatigability, worse after exertion and deteriorating
during stress, infection or trauma. Tendon reflexes are normal. There is also
an association with other autoimmune diseases (e.g. thyroid, SLE, rheumatoid
arthritis, pernicious anaemia).

CLINICAL FEATURES:
• The clinical picture of fluctuating weakness is characteristic, usually
  proximal and worse as the day progresses.
• Ocular symptoms include ptosis, diplopia and blurred vision worse on
driving, watching television, and reading.
• Bulbar weakness resulting in difficulty in chewing, swallowing, talking,
inadequate clearance of secretions and maintenance of upper airway. A
slack Jaw and a nasal voice can also be seen. An expressionless
Myasthenic Facies (Snarl), with weak respiration may give a false sense of
wellbeing.
• Proximal limb muscle weakness - neck flexors usually weaker than neck
  extensors. Deltoid, triceps, extensors of fingers and wrist and ankle
dorsiflexors are often weaker than other limb muscles.
• Respiratory muscle weakness with often absent gag reflex.
• Exhaustion and Ventilatory Failure (i.e. Myasthenic Crisis) leading to
  Coma.

DIAGNOSIS OF MYASTHENIA:
• Tensilon (Edrophonium test)
  -Edrophonium is a short acting anticholinesterase used in diagnosis of
    Myasthenia in patients with no previous history of the disease.
  -In known myasthenic patients with an acute deterioration the test may
differentiate a myasthenic crisis from a cholinergic crisis.
  -An initial dose of 2mg IV (with facilities for urgent intubation and
    ventilation at hand) is given, if there are no untoward cholingergic side
effects (see below) a further dose of 8mg is given a minute later.
  -A positive test is judged by improvement of weakness in 3 minutes of
    the injection.
• Electromyography.
• Serum acetylcholine receptor antibodies.
• CXR, CT or MR imaging of the chest may reveal a thymoma.
• Anti striated muscle antibodies, thyroid antibodies may be found.

TREATMENT:
• Oral anticholinesterases – Pyridostigmine (30-60 mg orally every 4-8hrs)
the dose is determined by patients response. Max 450mg/day. Overdose
results in cholinergic crisis. Other choline esterase inhibitors used are
Neostigmine and Distigmine.
• Immunosuppressant drugs – corticosteroids are used when there is no response to anticholinesterases. High dose steroids may exacerbate weakness. Patients should be hospitalised to start treatment. Other drugs include azathioprine, ciclosporin, mycophenolate.
• Plasmapheresis and immunoglobulins are of value in acute exacerbations of myasthenia.
• Thymectomy.

MYASTHENIA GRAVIS CRISIS

DEFINITION:
A myasthenia gravis crisis is defined as myasthenia gravis weakness severe enough to require mechanical ventilation.

BACKGROUND:
A number of factors have been identified as precipitants of a myasthenia gravis crisis. It is important to identify these precipitants as a fundamental principal of treating myasthenia gravis crisis is to remove them.

PRECIPITANTS OF MYASTHENIA GRAVIS CRISIS:
• Infections
• Medications:
  o Antibiotics - Aminoglycosides, ciprofloxacin, clindamycin.
  o Antiarrythmics - Procainamide, Lignocaine, Calcium Channel blockers, Beta-blockers.
  o Neuropsychiatric - Phenytoin, lithium, barbiturates, Chlorpromazine.
  o Analgesics – Pethidine, morphine.
  o Muscle relaxants – Suxamethonium.
• Stress – Recent surgery, trauma.
• Botulinum toxin administration.

MANAGEMENT:
Patients with myasthenia crisis can develop apnoea suddenly and they must be closely observed.

• Airway – open airway by suctioning secretions.
• Administer high flow oxygen and measure oxygen saturation by pulse oximetry In patient without gag reflex, an oral airway may be placed.
• Once the airway and breathing is stabilised the precipitating cause needs to be identified and removed.
• If respiration remains inadequate, ventilate by bag-valve mask while preparing to intubate.
• Contact anaesthetist for endotracheal intubation
• Assessment of severity with importance given to Vital Capacity and Bulbar function.
• ABG sampling to determine PaCO2 levels, pulmonary function test looking and FEV1, pulse oximetry.
• If there is evidence of weakness of respiratory muscles, FVC<1, hypoxia, raised PaCO2.
• Newly diagnosed myasthenics in crisis should be treated with Steroids, Azathioprine and Pyridostigmine.
• Emergent consultation with the neurologist for treatment with Plasmapheresis, immunoglobulin.
• Plasma exchange may be life saving.

CHOLINERGIC CRISIS
Cholinergic symptoms are usually at their most severe 2 hr after last dose of anticholinesterase. Symptoms and signs include sweating, bronchospasm with wheeze, cyanosis, colic, confusion, fasciculation, ataxia, small pupils, bradycardia, hypertension, seizures.

The SLUDGE syndrome (i.e., salivation, lacrimation, urinary incontinence, diarrhoea, GI upset and hyper motility, and emesis) also may indicate cholinergic crisis.

MANAGEMENT:
• ABG to look for raised PaCO2, pulse oximetry for oxygen saturation, FVC.
• If a deterioration of myasthenia fails to respond to edrophonium all drugs should be stopped and Atropine (1mg IV every 30 min to a maximum of 8mg). Glycopyrrolate can also be used.
• The edrophonium test should be repeated every 2 hours and the anticholinesterase be reintroduced when the test is positive.
• Mechanical ventilation is required If FVC<1L or PaCO2 is raised.