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# UNIT 4 EMERGENCIES IN ELDERLY

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## 4.0 OBJECTIVES

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After undertaking the activities in this unit, you should be able to:

- Identify the potential emergencies in geriatric population.
- Appreciate the common differential diagnosis in geriatric emergencies.
- Evaluate, first aid management and appropriate referral in geriatric emergencies.

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## 4.1 INTRODUCTION

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For a geriatrician, elderly patients coming with life threatening emergencies can serve as a challenging task. It is of vital importance, therefore, that we enhance our skills in history taking, clinical examination and a proper approach to ask for laboratory investigations and initiate treatment as soon as possible. In majority of cases, a good approach can save the life. This, accompanied by a precise clinical examination leads to a quick diagnosis, thus minimizing a battery of investigations and initiating the treatment earliest. In today's era of investigation dependent medical diagnostic system, accurate clinical diagnosis minimizes time and expenses incurred to the patients.

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## 4.2 UNCONSCIOUSNESS IN ELDERLY

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In coma, the patient is deeply unconscious and there is no response evoked by external or internal stimuli. The Greek word 'Kome' means deep sleep.

### 4.2.1 Common Differential Diagnosis

- 1) CVA ( e.g., Cerebral hemorrhage, massive cerebral infarction with edema, subarachnoid hemorrhage), encephalitis, meningitis, cerebral abscess, subdural or extradural hematoma, intracranial SOL, tentorial herniation, hypertensive encephalopathy, cerebral malaria, head injury, post- epileptic.
- 2) Diabetic Ketoacidosis, hypoglycemia, renal failure, hepato-cellular failure, respiratory failure, severe anoxia, myxedema coma, pituitary apoplexy, adrenal crisis, hyponatremia and eclampsia.
- 3) Drug or alcohol overdose, heat stroke and poisoning (barbiturate, organophosphorus, morphine).
- 4) Severe sepsis
- 5) Psychogenic.

#### Did You Know?

The Glasgow Coma Scale was 1<sup>st</sup> published in 1974 at the University of Glasgow by neurosurgery professors Graham Teasdale & Bryan

Initial assessment should focus on history (from relatives/ associates/ eyewitness) and general physical examination.

## 4.2.2 History and Physical Examination

### History

Onset, progress, premonitory symptoms, H/O epilepsy, features of increased intracranial tension (IIT), trauma (head injury), alcohol overdose, poisoning, suicidal tendency, high fever, dyspnea, chest pain, jaundice, hematemesis / melena, discharge from ear, urine output, hypertension, diabetes mellitus; circumstances in which the patient was found to be unconscious should be specially asked for.

### Physical examination

Perform a thorough physical examination. General appearance ( flushed face with parotid swelling in chronic alcoholism), eyes with special reference to pupil, jaundice, pattern of respiration ( frothy sputum coming through nose in Organophosphorus poisoning, odour of breath, ears ( for discharge),neck rigidity, tongue bite mark, involuntary movement, sweating, soiling of clothes, temperature, pulse (bradycardia in stokes- Adams syndrome / IIT (Increased Intracranial Tension), Blood Pressure, motor response (one side of the face may puff off with expiration in CVA with neurodeficit), hepatosplenomegaly (splenomegaly in cerebral malaria / typhoid state), and fundus examination ( diabetic retinopathy, papilloedema in IIT) should be performed.

In coma, plantar response is bilaterally extensor. *Often the localization of side of neurodeficit in CVA is not possible while the patient is in coma.*

## 4.2.3 Evaluation Outline

Following investigations may be useful

- i) Urine – Specifically for sugar, acetone & albumin.
- ii) Blood – Sugar, urea, creatinine, bilirubin, smear for malaria parasite, sodium, potassium, Arterial blood gas analysis. Blood should be sent for metabolic and endocrine studies (cortisol, TSH), and kept for drug screening (salicylates, barbiturates).
- iii) CSF- Meningitis, subarachnoid hemorrhage.
- iv) Examination of the vomitus or gastric contents (toxicology screening) - Naked eye examination of appearance of undigested tablets and the odour often clinch the diagnosis of drug overdose or poisoning.
- v) ECG – complete heart block, Acute Myocardial Infarction and tachyarrhythmias.

X-ray - usually not possible in comatose patient. X-ray in lying down position may be taken for skull/ chest (i.e., in injury).

CT scan - May detect structural lesion in brain. Early CT scan is often inconclusive in CVA (e.g., cerebral infarction).

#### 4.2.4 Management Outline

To maintain life, follow a→ b→ c→ d chronologically.

- 1) Place the patient on a soft mattress in supine position; bed with railed cot, if available; change of posture in every two hours. Prone in lateral position may prevent aspiration of gastric contents.
- 2) Maintain 'airway' by neck extension / chin lift; place oropharyngeal airway tube or endotracheal tube; suck the oropharynx to clear off the secretions. Always try to prevent the falling back of the tongue.
- 3) Ensure adequate 'breathing'; if necessary, give mouth to mouth ventilation. In a desperate situation give 100% O<sub>2</sub>, ventilate with face mask or Ambu bag.
- 4) Maintain adequate 'circulation', if carotid / femoral pulses are palpable, continue ventilation with O<sub>2</sub>. If pulses are not palpable and heart sounds are not audible, deliver a sharp blow to the center of the chest. If heart does not start immediately, start cardiac massage chest compressions at the rate of 100-120 compressions per minute and 1 ventilation for every 5-6 seconds for adult (Not more than 10-12 times) per minute.
- 5) After resuscitations by basic life support put a Ryle's tube, insert IV catheter (intracath), and apply a Foley's or condom catheter.
- 6) If necessary ( correct with drugs)
  - a) Maintain circulation – By 5% dextrose, normal saline or plasma.
  - b) Acidosis – inj Sodium bicarbonate (7.5%) 1 meq/kg, i.v; may be repeated after 10-15 minutes.
  - c) Suspected hypoglycemic – 100 ml of 25% GLUCOSE, I.V
  - d) Hypothermia – cover with blankets, continue o<sub>2</sub>, correct acidosis by inj Sodium bicarbonate (7.5%) 1meq/kg, I.V, to be given over 10 minutes.
  - e) Hyperthermia – start ice irrigation, ice bag on head, inj Chlorpromazine – 25 mg, I.M stat.
  - f) Administer 100mg Thiamine, I.V followed by 5 % dextrose, I.V especially in alcoholic as they are prone to develop Wernicke's syndrome.

- 7) General care of the comatose patient –
- a) Maintain intake-output chart.
  - b) Prevention of cutaneous pressure sore (bed sore ) – frequent change of posture in bed, maintain local hygiene ( by alcohol / spirit cleansing) ; bed should be dry and clean; use air cushions to protect pressure points; apply local antibiotic from the beginning of a small bed sore, and consult surgeon.
  - c) Care of the bladder, bowel and mouth – U – drain (Condom) catheter is preferable in male patients as indwelling catheters are common source of urinary infections.
  - d) Maintain Ryle’ tube, I.V catheter, condom / indwelling catheter (with I/O chart). Check vital signs.
  - e) Start antibiotics in the first chance, if evidenced by UTI, lobar pneumonia.
  - f) Maintain nutrition and hydration by Ryle’s tube feeding (3000 calories / day) or i.v alimentation.
  - g) Inj Pantoprazole 40 mg i.v once daily or sucralfate 1 g 6 hourly, orally to prevent stress ulcer.
  - h) Maintain normal body temperature.
  - i) Move legs and arms passively thrice daily to prevent leg vein thrombosis and frozen shoulder respectively.(Application of elastic stockings/elastocrepe bandage will also reduce the risk of deep vein thrombosis and aid in venous return to heart)
  - j) The patient may be shifted to intensive care unit.

**Check Your Progress – 1**

- 1) The principal cause of COMA is?
  - A) Destruction of large portions of both cerebral hemispheres.
  - B) Suppression of thalamocerebral function by drugs & toxins.
  - C) Hypoglycemia, anoxia, azotemia and hepatic failure causing hypo-cerebral function.
  - D) All of the above.
- 2) Hypothermia itself causes coma only when the temperature is?
  - A) < 34°C
  - B) <33°C
  - C) <32°C
  - D) <31°C
  - E) Most

- 3) cases of Coma (and Confusion) are due to?
  - A) Hemorrhage
  - B) Tumor
  - C) Metabolic or toxic origin
  - D) Hydrocephalus

## 4.3 SUDDEN RESPIRATORY DISTRESS

### 4.3.1 Common Differential Diagnosis

- 1) Acute left ventricular failure (LVF) or acute left atrial failure (Acute pulmonary edema).
- 2) Acute exacerbation of COPD or Bronchial asthma.
- 3) Cardiac tamponade
- 4) Spontaneous Pneumothorax (Tension)
- 5) Acute laryngeal obstruction like foreign body.
- 6) Anaphylaxis
- 7) Hysterical hyperventilation

Extra Edge!

Types of bronchial breathing:

1. Tubular – Low pitch (Consolidation)
2. Cavernous – High pitch (Cavity)
3. Amphoric – Metallic quality (tension Pneumothorax)

### 4.3.2 History & Physical Examination

#### History

Onset, progress, H/O chest pain (pneumothorax) or ingestion of foreign body, H/O penicillin administration (anaphylaxis), personality disorder (hysteria) and past history (similar episode may occur in LVF or bronchial asthma) to be considered.

#### Physical examination

The following is required to be undertaken in a case of sudden respiratory distress

- a) Look for orthopnea and central cyanosis.
- b) Pulse – Acute severe asthma – Pulsus paradox and Left ventricular failure – Pulsus alternans.
- c) JVP – raised in cardiac tamponade, LVF; prominent X- trough in tamponade.
- d) BP- hypertension – LVF.

- e) Respiration – Tachypnea and even orthopnea may be evident. Accessory muscles of respiration.
- f) Percussion – Cardiac Dullness is increased in tamponade, Obliteration of liver and cardiac dullness may be revealed in acute severe asthma and COPD. Tympanic resonance on affected side is obtained in pneumothorax.
- g) Auscultation –
  - i) Stridor – Anaphylaxis and laryngeal obstruction (upper airways)
  - ii) Rhonchi – in other situations (Lower airways)
  - iii) LVF – Rhonchi +, crepitation +++, gallop rhythm; vesicular breath sound and with prolonged expiration.
  - iv) Acute severe asthma or COPD – Rhonchi +++, crepitation+, heart sounds muffled; may have silent chest.
  - v) Pneumothorax (Spontaneous) – Diminished vesicular or absent breath sound on affected side, no adventitious sound.
  - vi) Anaphylaxis, acute pulmonary thromboembolism – Vesicular breath sound with prolonged expiration, occasional rhonchi and pleural rub (in PTE).
  - vii) Hysterical hyperventilation – Pause on between inspiration and expiration. No cyanosis; exaggerated symptoms in front of relatives. Carpo-pedal spasm may be seen due to tetany.

### 4.3.3 Evaluation Outline

#### Investigations

At least ECG, chest X-ray (PA view) and X-ray of neck (foreign body) should be done. Blood gas analysis may be informative.

### 4.3.4 Management Outline

- 1) Acute LVF, Acute LAF or Acute pulmonary oedma( Cardiac Asthma) –
  - \* Propped-up position in bed with moist O2 delivered (100%) through face mask or nasal prongs with high flow rate – up to 10-15 liters/min.
  - \* Inj LASIX (Furosemide) 40 mg I.V stat with or without bumetanide 1 mg, orally and may be repeated after 30 minutes.
  - \* Inj Morphine sulphate – Slow I.V injection in a total dose of 5-10 mg, at a rate of 2mg/ minute. Large doses of morphine may

produce respiratory depression and it should be avoided if systolic BP is < 90 mm of Hg.

- \* One tablet of nitroglycerine (0.5 mg/tab) is given sublingually, may be repeated after ½ hour. Inj nitroglycerine (5-100 microgram/min as infusion) may be given I.V to reduce the preload.
- \* Afterload reduction by I.V sodium nitroprusside (20-30 microgram/min) may be done if systolic BP is > 100 mm of Hg.
- \* Dobutamine (2.5-15 mg/kg/min) may be of some help i.v in cardiogenic pulmonary odema with shock and hypotension.
- \* The patient may be transferred to Cardiac ICU for continuous monitoring and further interventions for the underlying cardio-respiratory status.

#### **4.3.5 Few Special Points in the Treatment**

- 1) The patient is most comfortable in propped up position because this reduced venous return and central venous pressure I.V fluids should be restricted.
- 2) Morphine reduces anxiety, reduce venous filling pressure to the heart, shifts blood from lesser to the major circulation (pharmacological phlebotomy) and diminishes adrenergic stimuli to arteriolar as well as venous bed. Morphine induced emesis can be prevented by metoclopramide.
- 3) Sodium nitroprusside 50 mg is given in 500ml of 5% dextrose by slow IV infusion.
- 4) Angiotensin receptor blockers and ACE inhibitors diminish both after and preload, specially recommended in hypertensive patients.
- 5) BNP (recombinant brain natriuretic peptide) to relieve pulmonary edema, hemodialysis for renal failure may be started.
- 6) In clinical practice, most common causes of heart failure are ischemic heart disease (IHD), hypertensive heart disease, valvular heart disease and chronic kidney disease.

#### **4.3.6 A) Acute Severe Asthma (Status Asthmaticus)**

- 1) Propped – up position in bed with high concentration O<sub>2</sub> inhalation intranasally at the rate of 6-8liters / min. An I.V drip should be started with normal saline.
- 2) inj. Aminophylline – Loading dose is 5.8 mg/kg of bodyweight in 100 ml normal saline over 20 minutes followed by maintenance dose as mentioned below:



- \* Patients with CCF (Congestive Cardiac Failure) or hepatic disorder – 0.45 mg/kg/hour.
  - \* Patients over 50 years of age – 0.68 mg/kg/hour.
- 3) Inj hydrocortisone hemisuccinate – I.V infusion Loading dose – 4mg/kg of body weight for 4 hours, Maintenance dose – 3mg/kg/6 hour for next 24 hours.
  - 4) Nebulized salbutamol 5mg or terbutaline 10 mg with o2 as the driving gas may be started and repeated 2 to 4-hourly.
  - 5) Antimuscarinic bronchodilators e.g., ipratropium bromide (20-40 microgram, 3-4 times daily) by aerosol inhalation may be started with beta 2 adrenoceptor stimulants.
  - 6) Inj. Cefotaxime 1g, I.V, 12 hourly for 5-7 days to prevent pulmonary infection.
  - 7) Maintenance of fluid and electrolyte balance (repeated use of salbutamol may develop hypokalemia).
  - 8) Shifting to ICU and starting assisted (mechanical) ventilation in ICU if required i.e. – Pao2 < 60 mm of Hg and falling, PaCo2 > 45 mm of Hg and rising and PH < 7.3. or patient goes into coma/ respiratory arrest / drowsiness / totally confused / GCS <8)
  - 9) After the acute attack phase is over, following treatment plan to be continued –
    - a) Tab Salbutamol (2mg) or terbutaline (2.5 mg) – 1 tab, thrice daily, orally.
    - b) Tab Montelukast 10 mg orally daily in the evening may be used in mild to moderate persistent asthma.
    - c) Tab Prednisolone (10mg) – gradually tapered within 2 weeks.
    - d) Mucolytic( acetyl-cysteine) may be used in both attack phase and continued it after it too
  - 10) Inhalation of salbutamol/terbutaline/ corticosteroid/ipratropium bromide may be used in between the attacks. Never sedate the patient during attack. Avoid beta blockers. The patient should be admitted in the hospital for at least 5 days.

N.B: Monitor acute severe asthma by –

- 1) Spo2 should be kept > 92 % (check by pulse oximetry)
- 2) Arterial blood gas (ABG) analysis from time to time.
- 3) Repeated PEFr at 15-30 minutes interval.
- 4) Exclude pneumothorax by X-ray chest.

**Important Points:**

\*In severe acute asthma sedative & montelukast are not given.

\*MgSo4 is used in severe asthma

### 4.3.6 B) Acute Pulmonary Thromboembolism (Acute PTE or Acute Corpulmonale)

PTE occurs as a result of blood clots, or fat, foreign body, air tumour emboli. Diagnosis needs high index of suspicion. Unexplained chest pain and respiratory distress in a suspicious patient should always raise the possibility of PTE. Clinically, there are tachypnea, tachycardia and usually a clear chest on auscultation.

Chest X-ray is usually normal. ECG shows non-specific ST-T changes or S1Q3T3 pattern; plasma D-dimer levels are high. It is an acute emergency and should be tackled by:

- 1) Absolute bed rest. High flow moist oxygen inhalation at the rate of 4-6 liters/min.
- 2) Normal saline drip started.
- 3) Severe chest pain may be relieved by inj pethidine 100 mg I.M or inj morphine 15 mg I.M( avoid in severe hypotension)
- 4) Inj Heparin sulphate – 10000 units, I.V bolus stat, followed by 5000 units I.V, 6 hourly, in 200 ml of normal saline ( via a side connector) for at least 5 days ( may be continued up to 10 days). Low molecular weight heparin (LMWH) given in S.C route has the same effect as unfractionated heparin (e.g., enoxaparin is used in a dose of 1mg/kg twice daily subcutaneously). LMWH is well tolerated, easier to administer, eliminates the need for frequent monitoring of aPTT, and is the treatment of choice in acute PTE. The target INR should be 2.5.
- 5) Start oral anticoagulation with tablet warfarin sodium (5mg/tab) from the 2<sup>nd</sup> day as 1 tab twice daily for at least 3-4 weeks till the patient becomes ambulant, and then tapered gradually ( to keep the INR at 2.5 – 3.0 . it may be continued for 6 months. Patients with underlying prothrombotic risk will continue it for life long.
- 6) Inj Dopamine infusion in hypotension or shock. To maintain the systemic BP near about 90-100 mm of Hg.
- 7) Thrombolytic therapy – In massive embolism with systemic hypotension, streptokinase or urokinase is injected into the pulmonary artery through a catheter ( 2.5 lakh units) followed one hourly by 1 lakh units, I.V for 2-3 days ; or t-PA , 100 mg given in a drip over 2 hours as an infusion ( most preferred agent). The treatment by t-PA is very costly.
- 8) Digitalis – digoxin 0.5 mg is given I.V, rapidly to increase the right ventricular output.

9) Angiotensin - Converting Enzyme (ACE) inhibitors are tried but not much beneficial.

10) Surgical – pulmonary embolectomy is now rarely performed.

\* The dose of heparin is adjusted on the basis of clotting time / aPTT( maintained at 1 1/2 – 2 times of controlled value) and that of warfarin is adjusted by the result of PT (prothrombin time). LMWH needs no monitoring of coagulation profile.

\* Risk factors for PTE –

- 1) Post-surgical, pregnancy, Post- partum state, old age.
- 2) Prolonged immobilization in bed, Fracture of long bones of leg, Carcinoma of pancreas.
- 3) Obesity, Prolonged use of oral contraceptive pills, hypercoagulable states.
- 4) Chronic deep venous insufficiency in legs, acute mi and hyper viscosity syndrome.

\* N.B: - Prevention of DVT –

- a) Wear DVT stockings.
- b) Avoid prolonged immobilization.
- c) Active and passive movements of lower limbs to be adopted. Frequent change of posture is a must.
- d) Calf and respiratory exercises.
- e) Avoid getting dehydration or treat dehydration promptly.
- f) Prophylaxis by LMWH.

### **Check Your Progress – 2**

- 1) A 67 years old male presents to casualty with worsening dyspnea after returning from a 3 day business trip to Canada. His vitals: BP 110/60, P 102, O2 sat 86% on room air, and examination findings revealed distended neck veins, Regular rhythm w/o murmur, lungs clear, normal upper respiratory tract examination.
  - a) What is your most probable diagnosis?
  - b) Briefly discuss the modified Wells Criteria?
- 2) Most common reason for poor control of asthma is?
  - A) Continued exposure to allergens.
  - B) Use of cyclooxygenase (COX) inhibitors.
  - C) Noncompliance with medication
  - D) Gastro esophageal reflux

- 3) Which of the following is most common & characteristic feature of asthma?
  - A) Cough.
  - B) Nocturnal awakening with dyspnea and/or wheeze.
  - C) Constriction feeling in chest
  - D) Perspiration

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## 4.4 ACUTE CHEST PAIN

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Let us learn more about evaluation of a case of Chest Pain

### 4.4.1 Common Differential Diagnosis

- 1) Pneumothorax.
- 2) Acute myocardial infarction (AMI) / Angina pectoris (IHD).
- 3) Trauma to the chest wall.
- 4) Acute dry pleurisy due to any cause / acute dry pericarditis.
- 5) Oesophagitis / Diffuse oesophageal spasm.
- 6) Costochondritis.
- 7) Malignant deposits on the ribs, rib fracture, intercostal myalgia, herpes Zoster on the chest wall, multiple myeloma.
- 8) Dissection of ascending aorta.
- 9) Hiatal hernia, gall bladder disease, acute pancreatitis.
- 10) Pulmonary thromboembolism (PTE).
- 11) Cardiac neurosis (psychogenic).

### 4.4.2 History & Physical Examination

#### History

##### a) Pain

Onset, progress, pain with movement, actual site and character of pain, aggravating and relieving factors, duration, relation with food, associated symptoms (e.g., profuse perspiration and vomiting are present in AMI), dyspnea present or not (AMI, pneumothorax, PTE, dissection of aorta are associated with dyspnea), shock (AMI, tension pneumothorax, PTE etc.), radiation of pain, any personality disorder should be taken into account.

\* Retrosternal chest pain – AMI, dissection of aorta, PTE, pericarditis and psychogenic.

\*\* Character - :

- a) Tenderness – in musculoskeletal disorders,
- b) Pleuritic in nature
- c) Chest pain with abdominal pain –AMI, basal pleurisy.
- d) Retrosternal chest pain with dysphagia – DES.
- e) Diffuse chest pain with tenderness all over the chest – Trauma and cardiac neurosis.

### Physical examination

Pallor, pulse, BP, JVP, cyanosis, edema, decubitus, features of shock, vesicles on the chest wall, tenderness, heart sounds, gallop, pericardial rub, breath sound, rhonchi, crepitation, pleural rub should be meticulously searched / examined.

### 4.4.3 Evaluation Outline

Investigations:

Some of the common investigations required will be

- a) ECG
- b) Chest X-ray (PA view)
- c) Others: Cardiac injury enzymes (e.g., CK and CK-MB, AST, LDH, Troponin T and Troponin I), USG of abdomen, plasma D-dimer assay (e.g., PTE), barium swallow or upper G.I. endoscopy.

#### Did You Know?

LAD (Left Anterior Descending) is also known as “Widow’s artery”.

1. Anterior Wall MI – V1 – V6, LI, AVL.
2. Inferior Wall MI – LII, LIII, AVF.
3. Lateral Wall MI – LI, AVL, V5, V6
4. Antero Septal MI – V1-3

### 4.4.4 Management Outline

A) Angina Pectoris – ( chronic stable angina )

1) Acute attack –

- a) Isosorbide dinitrate (5mg / tab) or glycerol trinitrate (GTN; 0.5 mg/tab) – 1 tab to be placed sublingually (GTN may be used as spray). Usually pain is relieved within 2-5 minutes. If not relieved, any of the drug may be repeated after 10 minutes. If the chest pain continues after use of 2/3 tablet, think of AMI.

- b) Acetyl salicylic acid (75-150 mg/ tab) – 1 tab stat and to be continued indefinitely as 1 tab daily after meal. Clopidogrel (75 mg) – 1 tab daily may be started (instead if aspirin) or added with aspirin.
  - c) To reduce anxiety Tab Alprazolam (0.25/0.5 mg per tablet) or Diazepam (5mg) – 1 tablet may be given instead.
- 2) Prevention of further attacks –
- a) Restful life. Avoid weight gain, smoking, exertion and psychic stress. Salt restricted, fat free, light diet.
  - b) Continue isosorbide dinitrate (5mg/tab) - 1 tab 4 times daily (may produce headache). Isosorbide- 5 mononitrate (20 mg/tab) may be used instead (1 tab twice daily; 8 A.M and 3 P.M. – known as eccentric dosage schedule).

N.B – Bisoprolol 5-10 mg, daily, orally may be continued. Calcium channel blockers (CCB) like nifedipine – 10 mg, 6- 8 hourly daily, orally or amlodipine (2.5 – 10 mg daily, orally) or verapamil 120-240 mg, 8 hourly daily may be prescribed.

Beta blockers reduce myocardial O<sub>2</sub> demand by reducing the heart rate and myocardial contractility. CCBs reduce myocardial O<sub>2</sub> demand by relaxing coronary arteries and vasodilation. Potassium channel activators e.g., nicorandil (10-30 mg, BD, orally) may also be helpful.

- c) Prinzmetal's angina – Nifedipine 5- 20 mg, 8 hourly daily, orally.
- d) Regular BP and ECG (resting). Stress ECG treadmill test and echocardiography may be performed. The patient is advised to carry isosorbide dinitrate 95mg/ tab) or glycerol trinitrate (0.5 mg/ tab) with him, and to be kept under tongue if there is chest pain. In uncontrolled angina pectoris, coronary angiography should be performed.
- e) Associated systemic hypertension, diabetes mellitus, hyperlipidemia should be treated by diet control and drugs.
- f) In uncontrollable angina pectoris – Patient may be advised to do coronary angiography with a view to undergo coronary artery bypass grafting (CABG) or percutaneous trans luminal coronary angioplasty (PTCA).

N.B. – ABCDE for treatment and secondary prevention –

A- Aspirin and anti-anginal therapy.

B- Beta-blocker and BP (control).

C- Cessation of cigarette smoking and control of cholesterol.

D- Diet (modification) and diabetes (control)

E- Education (for lifestyle modification) and exercise training.

B) Acute Myocardial infarction (AMI) –

It is the death / necrosis of the myocardium due to acute occlusion of a coronary artery resulting from plaque rupture and thrombosis.

1) First aid –

- a) Bed rest. Give reassurance. O<sub>2</sub> inhalation at rate of 4-6 liters/minute.
- b) Take brief history and ask risk factors & co-morbidities and try to examine the patient.
- c) Tab Isosorbide dinitrate (5mg/ tab) or tab glycerol trinitrate (0.5 mg/ tab) – 1 tab to be kept under tongue immediately and to be repeated every 5 minutes till relief of chest pain. Discontinue if hypotension develops.
- d) Insert I.V cannula.
- e) Inj morphine sulphate (to tackle chest pain) – 10 mg, I.V stat, may be repeated (5mg, I.V) if necessary.
- f) Acetyl salicylic acid (aspirin, 150-300 mg/tab) – 1 tab stat to be chewed or clopidogel 300 mg given orally as gel.
- g) InjMetoclopramide 10 mg, I.V stat (as an antiemetic).
- h) ECG – 12 lead, cardiac enzymes blood test – CK-MB, AST, LDH, troponin T and Troponin I, blood count, ESR, electrolytes ( Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>) , glucose and lipid profile. Repeat the enzymes study at 12 hrs. and 24 hrs. Remember, CK-MB is elevated in AMI, myocarditis or after electrical cardioversion.
- i) Patient is shifted to Cardiac ICU at the earliest opportunity.

2) Specific therapy :

- a) If the patient comes within 12 hours ( preferably within 6 hours) of the onset of symptoms then – Thrombolysis by inj streptokinase- 1.5 million units dissolved in 100 ml of normal saline and infused by I.V route over 1 hour. Anistreplase (30 units, single I.V injection given over 5

minutes), alteplase or human tissue plasminogen activator or t-PA (infusion schedule as 15 mg bolus followed by 50 mg in the first 30 minutes and then 35 mg in next 1 hour), urokinase (1.5 million units bolus plus 1.5 million unit as infusion over 1 ½ hours) may be substitute of streptokinase. Newer thrombolytic drugs reteplase (r-PA) and tenecteplase (TNK-t-PA) facilitate rapid administration of fibrinolytic therapy.

- b) I.V metoprolol 10 mg / I.V atenolol 10 mg relieves pain, reduces the chance of arrhythmias and also diminishes the size of infarction – if the patient reaches the casualty within 12 hours of the onset of symptoms.

Beta blockers are helpful to combat ongoing chest pain, tachycardia and hypertension. In hypotension, bradycardia, CCF and heart block, betabockers cannot be used.

\* Inj heparin, S.C 5000 twice daily may prevent deep vein thrombosis and left ventricular thrombus formation. After successful thrombolysis, inj heparin 5000 units, S.C, twice daily may be continued for 7 days (in addition to daily oral aspirin). Enoxaparin, a LMWH may be used 1mg/kg twice daily, subcutaneously instead. Oral anticoagulation with Warfarin may follow inj Heparin or LMWH.

3) Treatment of complications :

- a) Cardiac asystole – CPR, if fails, temporary pacemaker.
- b) Ventricular fibrillation – DC shock, cardiopulmonary resuscitation (CPR)
- c) Paroxysmal atrial tachycardia – inj Verapamil 10 mg, I.V
- d) Heart block – inj atropine 0.6 mg, I.V stat, repeated if necessary; pacemaker.
- e) Atrial fibrillation or flutter – Digoxin 0.25 mg I.V stat; synchronized DC shock in rapid ventricular rate with hypotension or circulatory collapse.
- f) Cardiogenic shock – O<sub>2</sub> (8-10 liters/min), normal saline drip, dopamine infusion ( 2-20 microgram / kg / min), inj hydrocortisone hemisuccinate ( 200 mg , I.V stat and repeated 100 mg, 4 hourly, I.V), intra-aortic balloon counter pulsation may be tried.
- g) Chest pain – inj. Morphine sulphate, 5 mg, I.V. stat given and may be repeated after 10-15 minutes. In recurrent



chest pain I.V. nitroglycerine at the rate of 0.6-1.2 mg/hr.  
I.V. heparin (1000 units/hr.) are to be infused.

- 4) Symptomatic treatment :
  - a) Restlessness – Diazepam (5 mg/tab), 1 tablet twice daily may be given.
  - b) Constipation – Tab dioctyl sodium sulphosuccinate 200 mg at bed time / Isapgol husk 2-4 tsp. in tepid water at bed time.
- 5) General treatment :
  - a) Record vital signs regularly.
  - b) Low calories diet; multiple small feeds from the 2<sup>nd</sup> day onwards (liquid diet on the 1<sup>st</sup> day). Diet should contain fibres. Stop smoking.
- 6) Discharge –
  - a) Usually after 7-10 days (depends on complications) with an advice to restrict physical activities for 4-6 weeks.
  - b) Diet and lifestyle management: Consume low calorie, low fat, low cholesterol and high fibre diet, avoid smoking and alcohol.
  - c) Control diabetes and hypertension.
  - d) Regular exercise with control of weight
  - e) Tab Aspirin 75 – 150 mg/tab or clopidogrel (75-150 mg/tab) – 1 tab daily after meal to continue indefinitely until further advice. Aspirin reduces post infarct mortality and reinfarction.
  - f) Tab Isosorbide dinitrate (5mg/tab) – 1 tab to be placed sublingually,SOS at the onset of chest pain.
  - g) Tab Ramipiril 2.5- 10 mg orally daily or lisinopril 5-10 mg orally daily are other alternatives. Angiotensin receptor blockers are given in those who is not tolerating ACE inhibitors.
  - h) Statins – Atorvastatin (5-20 mg) orally daily given at bedtimes to co troll hyperlipidemia.

N.B.: Unstable angina is managed by –

- 1) Absolute bed rest. Continuous ECG monitoring. Rule out AMI by ECG and Cardiac enzymes.

- 2) Aspirin 75 – 300 mg/day. Clopidogrel (75-150 mg, orally, daily) may be used.
- 3) Atenolol 50 – 100 mg daily or Metoprolol 50 – 100 mg twice daily, orally. If beta- blockers are contraindicated, it is better to start diltiazem (60 mg thrice daily) or verapamil (40 mg thrice daily) with gradual increment of dose later on.
- 4) Find out exacerbating factors e.g., Increased blood pressure, acute infection or chronic heart failure, and treat them accordingly. Statins may be added for plaque stabilization.
- 5) Patients refractory to medical treatment are advised to undergo coronary angiography with a view to undergo CABG or PTCA further.

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## 4.5 HYPERTENSIVE EMERGENCIES

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This is a life threatening event which demands immediate medical attention.

The common D/D are as follows –

- 1) Malignant hypertension.
- 2) Hypertensive acute LVF/ acute pulmonary edema.
- 2) Hypertensive encephalopathy.
- 3) Dissection of aorta.
- 4) CVA (cerebral hemorrhage commonly, also cerebral infarction and subarachnoid hemorrhage).
- 5) Hypertensive retinopathy.
- 6) Pheochromocytoma
- 7) Severe hypertension due to peripheral vascular disease.

### Did You Know?

**Osler's Sign** (*Pseudohypertension*). It is seen in older patients when the arteries get very thick, difficult to compress them, falsely elevates the blood pressure. Hence patient may develop dizziness on commencement of Antihypertensives or dose escalation.

### Outline of Management

- 1) Bed rest, propped up. Hospitalization is a must.
- 2) Diet – Salt free diet.
- 3) Sodium nitroprusside – Dose – Initially 0.3 microgram/kg/min, I.V usually 2-4 microgram/kg/min, maximum 10 mg/kg/min for 10 min.
- 4) Hydralazine – 5-10 mg I.V bolus dose is given at every 15 minutes.

- 5) Furosemide – 20 mg, I.V stat in shot push and may be repeated after ½ hour, if necessary. Electrolyte imbalance to be corrected.
- 6) Labetalol – 2mg/min up to 300 mg, or 20 mg over 2 min, then 40-80 mg at 10 min – intervals up to 300 mg total dose.
- 7) Nitroglycerine – Initially 5 microgram/min, then titrate by 5 microgram/ min at 3-5 min intervals, if no response occurs at 20 micro/min, one may incrementally increase the dose by 10-20 microgram/min.

N.B –

\* If patient develops cerebral hemorrhage and infarction (CVA), immediate reduction of high BP may hamper cerebral auto regulation and exacerbate cerebral damage. So, CVA is an exception among hypertensive emergencies where urgent BP reduction may be injurious to the patient.

\*In hypertensive emergency, BP should be reduced gradually so much so to attain the target level of 160/110 mm of Hg within 2 – 6 hours. Initially BP should be reduced up to 25% within minutes to one hour. Too much rapid and excessive reduction in BP may precipitate cerebral, coronary or renal ischemia.

\* Target BP to be achieved :< 140/90 mm of Hg in a patient who is < 60 years, or patients with diabetes or chronic kidney disease (CKD). Patient > 60 years should have BP < 150/90 mm of Hg.

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## 4.6 HYPOTHERMIA IN ELDERLY

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Mild 95<sup>0</sup>F – 89.6<sup>0</sup>F, Moderate 89.5–82.4, 89.6<sup>0</sup>F and severe hypothermia < 82.4<sup>0</sup>F

The common D/D are as follows –

- a) Accidental exposure to cold weather (especially elderly, diabetics, alcoholics, street beggars and in mountain climbers).
- b) Myxedema coma, hypothalamic lesions, hepatic coma, addisonian crisis, hypoglycemia, CVA.
- c) Sepsis and malnutrition.
- d) Immersion hypothermia.
- e) Artificial hypothermia induced in open heart surgery.

### Did You Know?

Risk factors for hypothermia-

- 1) Alcohol intoxication.
- 2) Homelessness & Low blood sugars.
- 3) Advanced age & Anorexia

Management outline

- 1) Cover the patient with blankets in a warm environment. Gradual warming is done with an aim to increase core temperature by 1<sup>0</sup>c/hour. Avoid alcohol, give warm fluids orally. Keep the patient horizontal or slightly head down.

- 2) O<sub>2</sub> inhalation (warm) – 4-8 liters/min.
- 3) Warm isotonic saline is started immediately.
- 4) Extracorporeal rewarming by hemodialysis and cardiopulmonary bypass; inhaled humidified air or peritoneal lavage may be done.
- 5) If PH is < 7.2, give inj sodium bicarbonate – 50 ml of 7.5% of the solution I.V
- 6) Blood investigation – serum Na<sup>+</sup>, K<sup>+</sup>, HCO<sub>3</sub><sup>-</sup>, PaO<sub>2</sub>, PaCO<sub>2</sub>.
- 7) ECG for arrhythmias and a chest X-ray pneumonia should be done. Monitor the vital functions with special reference to arrhythmias.
- 8) Arrhythmias are treated in ICU. Ventricular tachycardia/ fibrillation, or asystole is the usual cause of death. So long the patient is unresponsive to CPR and rewarmed to 89.6<sup>0</sup>F, the patient should not be declared dead.

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## 4.7 HEAT STROKE

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Heat Stroke is manifested along with systemic inflammatory response.

- 1) Disrobing the patient. Take the patient to ICU or in a cool and well-ventilated room (air conditioned room).
- 2) Vigorous massaging of the body and allow the patient to bath repeatedly in tepid water. For rapid cooling immerse the patient in ice water, or arrange fanning (to increase convection heat loss), or start gastric lavage with iced saline.
- 3) The aim is to reduce the core temperature to 102.2<sup>0</sup>F within 30-60 minutes.
- 4) Apply ice over the lateral aspect of the trunk.
- 5) 5% dextrose-saline I.V drip should be started immediately and to continue by the guidance of dehydration and central venous pressure.
- 6) Regularly checking vitals – pulse, BP, respiratory rate, rectal temperature and other vital signs. Send blood for renal function test, blood sugars, serum electrolytes, coagulation profile, serum calcium and also record ECG.
- 7) To treat hyperpyrexia (i.e., > 106.7<sup>0</sup>F or 41.5<sup>0</sup>C): use Ice water enema, antipyretic are not useful as the hypothalamic set point remains normal, Ice-cap application over forehead, O<sub>2</sub> at a flow rate of 4-8 liters/min, if patient develops convulsions – use inj diazepam 10 mg, I.V stat and may be repeated, if necessary.

**Check Your Progress – 3**

- i) A 69 years old man sought medical care at the hospital due to severe chest pain lasting 24 hours. The patient was a known hypertensive and smoker. Without any prior symptoms he started to have severe chest pain and sought emergency medical care after about 24 hours due to pain persistence.
- a) What is your most probable differential diagnosis for this case?
- b) Briefly discuss the management of the same.

**4.8 CEREBROVASCULAR ACCIDENTS (CVA)**

Let us learn how to evaluate the different kinds of cerebrovascular accidents

**4.8.1 Cerebral Thrombosis**

- a) Complete bed rest. Urgent hospitalization. Blood investigation for Complete blood count, sugars, renal function test, serum electrolytes, lipid profile and thyroid profile. Let the patient is made to sleep on railed cot. Ryle's tube and Foley's s catheter should be placed and secured. Around 2000 kcal should be given to the patient. In conscious patients without any bulbar weakness start with liquid then semisolid and later solid diet gradually as the patient recovers.
- b) Follow general care of the comatosed patient:
- c) Treat raised intracranial tension –
- i) Propped up position at 30<sup>0</sup> (improves jugular venous outflow without impairing cerebral perfusion).
- ii) I.V Mannitol (reduces cerebral edema / raised ICT by osmotic diuresis) – 100 ml (1-2g/kg) mannitol (20%) I.V thrice daily. It is good to start 300 ml I.V as bolus dose and then 100ml I.V, TDS to be continued for 2-3 days.
- iii) Inj dexamet hasone – 4-6 mg, I.M or I.V, 4-6 hourly. It may increase blood pressure and blood sugars. However it should be avoided in cytotoxic edema, head injury and CVA but reduces vasogenic reactive edema surrounding tumor, an abscess or brain metastasis.
- iv) Oral glycerol – 1-2g/kg/day in 3 divided doses. Usually it corresponds to 6 tsp. three times daily.
- v) Acetazolamide and lumbar puncture may help to lower ICT in idiopathic intracranial hypertension.

**Did You Know?**

The only thrombolytic agent approved for the treatment of acute ischemic stroke is: **Tissue Plasminogen activator (t-PA).**

- d) Antiplatelet drugs (Aspirin 75-300 mg/day orally), Clopidogrel 75 mg orally daily is an alternative to aspirin, or may be combined with aspirin.
- e) Reduce the high blood pressure by calcium channel blockers or diuretics or ACE/ARB inhibitors.
- f) Control other co-morbid conditions like diabetes mellitus, hyperlipidemia and obesity.
- g) Perform and early CT scan of the brain or MRI stroke protocol.

#### **4.8.2 Cerebral Embolism**

First 3 steps are same as of the above management in cerebral thrombosis.

Specific treatment includes –inj heparin sulphate 5000 units, I.V infusion, 6 hourly for 5 days along with,

Tab Warfarin sodium 5mg/tab started from 2<sup>nd</sup> day as 2 tab daily for 2 days and then 4 tab daily to be continued for 6 months. Inj. Heparin sulphate should be withdrawn after 5 day and let warfarin to be continued alone.

Treat the underlying cardiac disorder (atrial fibrillation) with digoxin.

N.B – Early CT scan should rule out cerebral hemorrhage or tumor before giving inj heparin. Heparin and warfarin are specially indicated in an evolving stroke when the patient have atrial fibrillation, paroxysmal arrhythmia or cardiac valve lesions.

#### **4.8.3 Cerebral Hemorrhage**

- Initial first 3 steps to be followed as of cerebral thrombosis.
- Inj Sodium nitroprusside for reduction of blood pressure. Try to maintain blood pressure just below 160/100 mm of Hg or mean arterial pressure 130 mm of Hg to preserve the cerebral auto regulatory mechanism.
- CT scan of the brain showing > 3cm hematoma or the patient progressively deteriorates, consult neurosurgeon for surgical drainage of the hematoma.

N.B – Aspirin and clopidogrel are absolutely contraindicated in cerebral hemorrhage and very big cerebral infarction. Care of bladder, bowel, lung infections and bed sore to be seen seriously.

#### **4.8.4 Subarachnoid Hemorrhage**

- Follow first 3 steps as of cerebral thrombosis.
- Nimodipine – 30 mg/tab, should be crushed and introduced through Ryle's tube. Recommended dose is 2 tab 4 hourly to be started

within 3-4 days of subarachnoid hemorrhage and usually continued for 3 weeks.

- Hypertension is controlled by diuretics and ACE-inhibitors.
- Refer the patient to neurosurgeon for surgical treatment post MR angiography done. Must be planned for clipping of the neck of aneurysm, embolization.
- Watch for hypoglycemia, hypotension, hypovolemia, hyperglycemia, hyponatraemia and hyperpyrexia to prevent delayed cerebral ischemia.
- Anticonvulsants are used for prophylaxis and injdexamethasone can be used for reduction of cerebral edema.

**\* Check Your Progress – 4**

- 1) If a person has an ischemic stroke, how quickly should the person be treated to minimize long-term problems?
  - A. within 30 minutes
  - B. within 1 hour
  - C. within 2 hours
  - D. within 3 hours
- 2) Which type of medicine is given to help prevent a stroke?
  - A. Blood-thinner medicine.
  - B. Clot-busting medicine.
  - C. A & B
  - D. None of the above.
- 3) A 78 years old female collapse at home while eating dinner with her daughter. On examining the patient in casualty, you notice she has garbled speech, right sided hemiplegia, able to briskly follow commands with left side, and able to write answers to questions.
  - a) What is your diagnosis?
  - b) Briefly write the management of the same.

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## 4.9 STATUS EPILEPTICUS

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When convulsions and unconsciousness recur without any intervening normal period in between, it is known as status epilepticus. Clinically it is a life threatening condition where the duration of seizure is more than 5minutes and demands prompt use of anticonvulsants.

Management outline -

- Immediate shift the patient to ICU for optimal management.
  - Railed cot, mouth gag to prevent tongue bite. Avoid head pillow. Place in any lateral position with foot end raised (to prevent aspiration pneumonia) and head turned sideways. Protect the patient from injury. Try to revisit the past history from patient's relatives.
  - Secure airway by repeated suction of mouth, nose and throat. Insert one oropharyngeal tube. Administer O<sub>2</sub>.
  - Do not try to draw blood samples during convulsions. Blood samples can be taken once the patient is totally sedated for blood sugars, urea, creatinine, calcium, electrolytes, LFT and also for toxicology. Monitor vitals – pulse, BP, acidosis, intubation and ventilation.
  - Anticonvulsants- IV lorazepam (0.1 mg/kg) at the rate of 2 mg/min, may be repeated after 5 minutes or inj diazepam (0.2mg/kg) at the rate of 5 mg/min. Due to the short duration of action of lorazepam or diazepam administration of maintenance anticonvulsants immediately after the first dose is needed.
  - Start I.V phenytoin/fosphenytoin drip (1.5 mg fosphenytoin = 1 mg phenytoin), 15mg/kg to run at the rate of 50 mg/min.
  - Consider sodium valproate, I.V, 25 mg/kg if seizures continue in spite of inj Phenytoin, or who was taking valproate for the treatment of epilepsy.
  - Thiopentone sodium 100-250 mg, I.V slowly may be started and followed by 90-120 mg/hour infusion or phenobarbitone is started 20mg/kg I.V at a rate of 60 mg/min. These drugs need assisted ventilation.
  - If still not controlled finally I.V anesthesia with propofol (2mg/kg loading dose followed by 30-250 microgram/kg/min infusion) or midazolam (0.2 mg/kg loading dose followed by 0.75-100 microgram/kg maintenance dose as infusion may be considered.
  - O<sub>2</sub> inhalation to be continued at the rate of 2-6 liters/min.
  - 50 ml of 50% inj glucose, I.V often to abort an attack of hypoglycemia as this may be a triggering factor.
  - Discharge the patient from hospital with tab phenytoin (100 mg/tab) – 1 tab three times daily, orally, regularly till further instruction, follow-up at regular interval.
  - EEG is mandatory and CT or MRI brain scan must be done as soon as the acute stage is controlled.
- \* Lorazepam and diazepam may produce respiratory depression and hypotension.



## 4.10 HEMATEMESIS AND MELENA

The common D/D are as follows –

Peptic ulcer, rupture of esophageal varices, Mallory Weiss tear, gastritis and erosion, meckel's diverticulum, polyps, ulcerative colitis, hemorrhoids, vascular ectasia, diverticulosis, polyps, carcinoma and arteriovenous malformation.

Management outline -

- 1) Complete bed rest.
- 2) Vitals – Record pulse, BO, respiration, temperature and any sign of shock.
- 3) If the patient is in shock, then try to assess the amount of blood loss from history taking and orthostatic hemodynamic changes.
- 4) Ryle's tube insertion and O2 should be given through nasal catheter.
- 5) Blood is sent for grouping and cross matching, and for other laboratory tests (Renal function test, blood sugars, serum electrolytes, coagulation profile and LFT).
- 6) Ryle's tube suctioning intermittently and also examine the aspirate. Gastric lavage can be performed with cold isotonic saline.
- 7) I.V fluid therapy – start with Dextrose solution (10%) one pint followed by Ringer lactate one pint and total of around 4 bottles to be completed in 24 hours depending upon the amount of blood loss. Plasma expanders like low molecular weight dextran is infused to maintain the BP till blood is available for transfusion.
- 8) Inj. Ranitidine 50 mg, I.V, 3-4 times daily should be given till recovery. As soon as active bleeding stops and vitals improvement, start tablet ranitidine (150mg), 1 tab twice daily before meals.

Currently upper G.I endoscopy can be done at the bedside. Though it does not reduce the mortality, therapeutic endoscopy definitely reduces transfusion requirements, need for surgery and length of hospital stay.

### \* Bleeding Peptic ulcer –

- a) Blood should be given immediately as soon as it is available. To continue fluid drip after the transfusion is over.
- b) Upper G.I endoscopy is done as soon as the patient becomes stable.
- c) Oral Liquid antacid containing aluminum hydroxide and magnesium trisilicate s given 4-6 tsp. every 2 hourly daily through Ryle's tube.

- d) Endoscopically therapy to be given which includes adrenaline injection (1: 1000) given quadratically around the bleeding point, or thermal coagulation or by, mechanical devices like clips holding bleeding vessels. Therapeutic angiography by intra-arterial vasopressin or embolotomy with microcoils needs technical efficiency.

**\*Rupture of esophageal varices –**

- a) Blood transfusion is a must and lifesaving act. Try maintaining the fluid drip after the transfusion is finished.
- b) Vasopressin – 20 units in 200 ml of 5% dextrose. This should be given over 20 minutes and will be repeated again. It will continue again for another 12-24 hours after the bleeding stops. The therapeutic dose of vasopressin is 0.1-0.5 units/min.
- c) If bleeding still continues or recur, introduce a sengstaken-Blakemore tube (balloon tamponade).
- d) Emergency endoscopic sclerotherapy or variceal ligation/banding is tried if bleeding continues after tamponade.
- e) If still the bleeding is not controlled, surgical assistance e.g., TIPSS (Trans jugular intrahepatic Porto systemic stent shunting).
- f) Emergency surgery is done in most difficult situations, e.g., - Oesophageal transection or shunt surgery (porto-caval shunt or distal spleno-renal shunt).
- g) Inj. Vitamin K 10 mg, I.M/I.V daily for 3 consecutive days. Significant coagulopathy can be corrected by fresh frozen plasma (FFP 15ml/kg).
- h) All decompensated cirrhotic liver disease must be started on management of hepatic pre-coma/coma).

N.B. - Orthostatic hemodynamic changes – Drop in systolic BP > 10 mm of Hg, rise in pulse rate of >15 beats / min are seen with loss of 20% of the circulatory volume.

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## **4.11 HEMOPTYSIS**

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Usually hemoptysis is scant and stops spontaneously without specific therapy. If hemoptysis is prolonged, massive (> 200 ml/24 hour).

The common D/D are as follows –

Bronchogenic carcinoma, Tuberculosis, bronchiectasis, bronchial adenoma, mitral stenosis, arteriovenous manifestation, and chronic bronchitis.

- 1) Complete bed rest in semi-propped up position. Reassurance. This posture helps prevent asphyxiation due to aspiration of blood into lungs.
- 2) Chest X-ray. Blood investigations – Complete blood count, sugars, ESR, coagulation profile, arterial blood gas, blood grouping and cross matching.
- 3) I.V normal saline to be started at the rate of 100-150 ml/hour infusion.
- 4) Adequate oxygenation. Record vital signs (Pulse, BP, respiration, temperature) repeatedly maintain adequate BP. Strict input and output charting to be done.
- 5) If hypovolemic shock worsens then – give I.V normal saline bolus 1 pint, Head low position with intermittent O<sub>2</sub> therapy at the rate of 4-6 liters/minute. Blood transfusion, as early as possible.
- 6) Tab tranexamic acid (500mg / tab) may be added, 1 tab 3 times daily as fibrinolytic inhibitor. Inj ethamsylate (125mg/ml) – 2 ml, I.M/I.V stat in severe haemoptysis, as a coagulant.
- 7) Treatment of the cause – i.e., antituberculosis drugs for pulmonary tuberculosis, higher antibiotics for pneumonia, specific drugs for cardiac conditions like mitral stenosis to be given.
- 8) In case of respiratory distress one must consider asphyxiation due to aspiration. Intubation and suctioning are done by sending the patient to ICU. Endotracheal intubation is also indicated in ongoing bleeding, poor arterial blood gas and haemodynamically unstable patient.
- 9) Rigid bronchoscope – Ice cold lavage with local injection of epinephrine, suction the blood. Topical coagulation with laser photocoagulation (Nd: YAG laser) may be tried.
- 10) Removal of the clot should be done under bronchoscopic direct supervision.
- 11) In refractory cases Surgical help i.e., ligation of the bronchial artery catheterization and embolization in uncontrolled haemoptysis.

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## 4.12 ANSWERS TO CHECK YOUR PROGRESS

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### Check Your Progress – 1

- 1) D
- 2) D
- 3) C

**Check Your Progress – 2**

1) a) Acute Pulmonary thromboembolism (Acute PTE)

1) b) Modified Wells Criteria for PTE -

Features	Score (points)
Clinical signs and symptoms of DVT	3.0
No alternative diagnosis	3.0
Heart rate > 100 beats/min	1.5
Immobilization ≥ 3 days or surgery in the previous 4 weeks	1.5
Previous DVT or PE	1.5
Hemoptysis	1.0
Malignancy with active treatment in the past 6 months or under palliative care	1.0
<b>Pretest clinical probability</b>	
PE unlikely	≤ 4.0
PE likely	> 4.0

PE = Pulmonary embolism, DVT = Deep vein thrombosis.

2) C

3) B

**Check Your Progress – 3**

i) a) Most probable differential diagnosis –

Acute myocardial infarction (AMI) / Angina pectoris (IHD) – Most common (M/C) diagnosis here.

i) b) The Management is as follows –

- Acute Myocardial infarction (AMI) –

It is the death / necrosis of the myocardium due to acute occlusion of a coronary artery resulting from plaque rupture and thrombosis.

\* First aid – Bed rest. Give reassurance. O<sub>2</sub> inhalation at rate of 4-6 liters/minute.

\* Take brief history and ask risk factors & co-morbidities and try to examine the patient.

\* Tab Isosorbide dinitrate (5mg/ tab) or tab glycerol trinitrate (0.5 mg/ tab) – 1 tab to be kept under tongue immediately and to be repeated every 5 minutes till relief of chest pain. Discontinue if hypotension develops.

- \* Insert I.V cannula.
- \* Inj morphine sulphate (to tackle chest pain) – 10 mg, I.V stat, may be repeated (5mg, I.V) if necessary.
- \* Acetyl salicylic acid (aspirin, 150-300 mg/tab) – 1 tab stat to be chewed or clopidogel 300 mg given orally as gel.
- \* InjMetoclopramide 10 mg, I.V stat (as an antiemetic).
- \* ECG – 12 lead, cardiac enzymes blood test – CK-MB, AST LDH , troponin T and Troponin I, blood count, ESR, electrolytes ( Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>) , glucose and lipid profile. Repeat the enzymes study at 12 hrs. & 24 hrs. Remember, CK-MB is elevated in AMI, myocarditis or after electrical cardioversion.
- \* Patient is shifted to Cardiac ICU at the earliest opportunity.
- \* Specific therapy:
  - If the patient comes within 12 hours ( preferably within 6 hours) of the onset of symptoms then – Thrombolysis by inj streptokinase- 1.5 million units dissolved in 100 ml of normal saline and infused by I.V route over 1 hour. Anistreplase (30 units, single I.V injection given over 5 minutes), alteplase or human tissue plasminogen activator or t-PA (infusion schedule as 15 mg bolus followed by 50 mg in the first 30 minutes and then 35 mg in next 1 hour), urokinase (1.5 million units bolus plus 1.5 million unit as infusion over 1 ½ hours) may be substitute of streptokinase. Newer thrombolytic drugs reteplase (r-PA) and tenecteplase (TNK-t-PA) facilitate rapid administration of fibrinolytic therapy.
  - I.V metoprolol 10 mg / I.V atenolol 10 mg relives pain, reduces the chance of arrhythmias and also diminishes the size of infarction – if the patient reaches the casualty within 12 hours of the onset of symptoms.

Beta blockers are helpful to combat ongoing chest pain, tachycardia and hypertension. In hypotension, bradycardia, CCF and heart block, betabockers cannot be used.
- \* Inj heparin, S.C 5000 twice daily may prevent deep vein thrombosis and left ventricular thrombus formation. After successful thrombolysis, inj heparin 5000 units, S.C, twice daily may be continued for 7 days (in addition to daily oral aspirin). Enoxaparin, a LMWH may be used 1mg/kg twice daily, subcutaneously instead. Oral anticoagulation with Warfarin may follow inj Heparin or LMWH.

### Check Your Progress – 4

- 1) D. within 3 hours. Ischemic strokes are treated with a medicine called t-PA and it should be given within 3 hours.
- 2) A. Blood thinners (Anticoagulants). Clot-Preventing (Antiplatelet) and not Clot busters (t-PA) along with blood thinners (Anticoagulants) help prevent a stroke.
- 3) a) – Diagnosis – Cerebrovascular accident (Acute thrombotic ischemic stroke).  
b) –
  - 1) Complete bed rest. Urgent hospitalization. Blood investigation for Complete blood count, sugars, renal function test, serum electrolytes, lipid profile and thyroid profile. Let the patient is made to sleep on railed cot. Ryle's tube and Foley's s catheter should be placed and secured. Around 2000 kcal should be given to the patient. In conscious patients without any bulbar weakness start with liquid then semisolid and later solid diet gradually as the patient recovers.
  - 2) Follow general care of the comatosed patient in coma pt.
  - 3) Treat raised intracranial tension –
    - i) Propped up position at 30<sup>0</sup> (improves jugular venous outflow without impairing cerebral perfusion).
    - ii) Mannitol (reduces cerebral edema / raised ICT by osmotic diuresis) – 100 ml (1-2g/kg) mannitol (20%) I.V thrice daily. It is good to start 300 ml I.V as bolus dose and then 100ml I.V, TDS to be continued for 2-3 days.
    - iii) Inj dexamethasone – 4-6 mg, I.M or I.V, 4-6 hourly. It may increase blood pressure and blood sugars. However it should be avoided in cytotoxic edema, head injury and CVA but reduces vasogenic reactive edema surrounding tumor, an abscess or brain metastasis.
    - iv) Oral glycerol – 1-2g/kg/day in 3 divided doses. Usually it corresponds to 6 tsp. three times daily.
    - v) Acetazolamide and lumbar puncture may help to lower ICT in idiopathic intracranial hypertension.
  - 4) Antiplatelet drugs (Aspirin 75-300 mg/day orally), Clopidogrel 75 mg orally daily is an alternative to aspirin, or may be combined with aspirin.
  - 5) Reduce the high blood pressure by calcium channel blockers or diuretics or ACE/ARB inhibitors.

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## 4.13 LET US SUM UP

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In this section, you have learnt about the common emergencies encountered in geriatric clinical practice. Each symptom should be carefully analyzed, and relevant examination carried out, in order to narrow down the list of differentials. You have also learnt the clinical examination and systematic approach under various sub-headings. It is vital to examine all the systems in the prescribed format to avoid missing important clinical findings and achieve comprehensive assessment of the patient. After the clinical examination is accomplished, a set of differential diagnosis must be enlisted at the end of every case which helps in a proper approach to the disease. The learner should then foresee the plan of investigations as per the findings and treat the emergency at the earliest.

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## 4.14 REFERENCES AND FURTHER READINGS

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