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Resource view

Resource name	Respiratory PLAB 1 notes
Resource description	Respiratory Medicine
Resource content	

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RESPIRATORY PLAB 1 NOTES 2014

Presenting symptoms

1. Cough
2. Shortness of breath = Dyspnea = breathlessness
3. Stridor
4. Wheeze
5. Hemoptysis
6. Hoarseness of voice
7. Sputum
8. Apnea (cessation of breath)
9. Orthopnea (shortness of breath when lying flat, sign of LVF)
10. Chest pain

COUGH

- A. Dry cough = no sputum
- B. Productive cough = with sputum

Causes of dry cough

1. Atypical pneumonias (chlamydia psittaci, mycoplasma, legionella, pneumocystis jiroveci or carinii)

2. Interstitial lung disease
3. Asthma
4. Bronchogenic carcinoma

Causes of productive cough (This is cough with sputum)

1. Pneumonia (commonest)
2. Bronchiectasis
3. Lung abscess
4. Tuberculosis
5. Pulmonary edema
6. Infective exacerbation of COPD

Cough

- A. Acute
- B. Chronic

ACUTE COUGH

1. Asthma
2. Allergy
3. Drug side effect e.g. ACE inhibitors
5. Foreign body inhalation or aspiration-usually sudden onset.

CHRONIC COUGH

1. Tuberculosis
2. Lung cancer
3. COPD
4. Bronchiectasis
5. Interstitial lung disease

CAUSES OF DRY COUGH

1. Atypical pneumonia=all have dry cough

i) **Legionella**: history of travel abroad for a business trip or holiday or staying in a hotel, patchy consolidation on the chest x-ray. Legionella colonizes water tanks in hotel at 60 degrees.

ii) **Mycoplasma Pneumonia**: flu-like illness, dry cough and patchy consolidation on the chest X-ray

iii) **Pneumocystis jiroveci/carinii**: dry cough, HIV patient or homosexual or IV drug abuser or from Africa, low CD count cell.

iv) **Chlamydia psittaci**: dry cough, contact with birds or works in a parrot shop

* If unsure about atypical pneumonia- choose MYCOPLASMA.

2. Asthma

- Dry cough at night
- History or family history of atopy i.e. eczema, hay fever, asthma or history of allergy to other things.
- Wheeze

3. Interstitial lung disease

- History of working in a coal mine, pharmaceutical companies or exposure to dust usually due to occupation.

4. Lung carcinoma (bronchogenic carcinoma)

- Usually elderly patient
- Weight loss, anemia, tiredness, anorexia, fatigue
- Smoking history
- Hemoptysis

PRODUCTIVE COUGH (COUGH WITH SPUTUM or PHLEGM)**1. Pneumonia**

- Cough, fever, shortness of breath
- Pleuritic chest pain- Chest pain which is worse on inspiration
- Rusty brown sputum
- Chest X-Ray shows consolidation

2. Infective exacerbation of COPD

- Fever, cough with sputum
- Chronic shortness of breath
- Long-term history of smoking history
- Usually middle aged man between 35-55 years old

*There is usually long standing history of smoking in a middle-aged man

3. Bronchiectasis

- Productive cough with green/yellow sputum more in the morning
- History of recurrent chest infection
- History of cystic fibrosis (failure to thrive as a child, rectal prolapse, recurrent chest infection as child)
- Caused by recurrent chest infections leading to localized and irreversible dilation of airways

4. Lung abscess

- Purulent sputum
- Fever usually swinging fever or intermittent fever)
- History of alcohol abuse suggest aspiration

* Swinging fever always means ABSCESS.

5. Tuberculosis

- Patient from Africa or Asia or if within the UK its homeless alcoholic
- There can be history of intravenous drug use or homosexual which suggest that HIV more likely.
- Weight loss, night sweats, haemoptysis, chest pain
- Lymphadenopathy (enlarged lymph nodes)

NB: In an HIV patient weight loss with purulent sputum is TB, but weight loss with dry cough its Pneumocystis carinii pneumonia (PCP).

SPUTUM

1. **Rusty brown** means pneumonia
2. **Pinky frothy** is clear sputum with tinge of blood means pulmonary edema or left ventricular failure
3. **Mucoid sputum** means pneumonia
4. **Purulent sputum** usually in lung abscess, bronchiectasis or pneumonia caused by staphylococcus aureus.

HAEMOPTYSIS - this is coughing up of blood**1. Pulmonary embolism**

- Usually young patient
- Risk factors (COCP, pregnancy, long flights e.g. from South Africa, America or Australia. If patient from Africa it can be PE as well as it is also a long flight from Africa but make sure it not TB or Pneumocystis jiroveci.
- Post-operative usually 7-10 days post operatively or after fracture of the long bones.
- ECG findings:
 - a. Sinus tachycardia
 - b. RBBB
 - c. T wave inversion V1-V4
 - d. SIQIII T syndrome
 - e. AF

NB: fat embolism usually causes confusion and rashes all over the body.

2. Tuberculosis causes haemoptysis - please see above**3. Pulmonary oedema**

- Usually pinky frothy sputum
- Cough
- History of valvular heart disease especially mitral stenosis or LVF
- Chest X-Ray shows bilateral fluffy opacities or or enlarged hear heart if there is heart failure.

4. Bronchogenic carcinoma please see above

5. Good pasture's syndrome - its an autoimmune disease in which antibodies are formed against basement membrane of the glomerulus (kidney) and basement membrane of the alveoli (lung). Therefore you have haemoptysis and renal symptoms.

Symptoms

- Young patient
- Proteinuria
- Haematuria
- Haemoptysis

6. Lung abscess especially if there is cavitation, history of swinging fever, purulent sputum, chronic alcoholism and aspiration.

7. Anti-coagulant e.g. warfarinSHORTNESS OF BREATH OR DYSPNOEA OR BREATHLESSNESS

- A. Acute
- B. Chronic

ACUTE

1. Asthma
2. Pulmonary Embolism
3. Myocardial Infarction
4. Pneumonia
5. Pneumothorax
6. Pulmonary oedema (acute left ventricular failure)
7. Anaphylaxis

8. Foreign body
9. Exacerbation of COPD
10. Anxiety
11. Carbon Monoxide poisoning

CHRONIC

1. COPD
2. Tuberculosis
3. Bronchogenic carcinoma
4. Chronic Heart failure
5. Mesothelioma
6. Sarcoidosis
7. Chronic anemia
8. Cor pulmonale –right ventricular failure due lung problem.

ACUTE SHORTNESS OF BREATH

1. Myocardial Infarction

- Elderly or middle aged patient
- Central crushing central chest pain radiating to the neck or left arm
- Nausea and vomiting
- Sweating usually in the palms
- Shortness of breath only if there is underlying pulmonary edema secondary to LVF

2. Spontaneous Pneumothorax

- Usually young, tall, thin man
- Sudden onset of shortness of breath
- Sudden onset of chest pain
- There is no history of trauma but sudden chest pain and shortness of breath usually start while doing exercise e.g. playing football or riding a bicycle.

3. Anxiety or Panic attack

- Young female with previous episodes of panic attack
- Peri-oral paraesthesia, tingling and numbness in the hands due to low ionic Calcium secondary to hyperventilation and CO₂ wash down.
- Shortness of breath with difficulty to take deep breath
- Palpitations, feeling of impending doom
- Feeling that they are having heart attack or going to die

Treatment: re-breathing through a paper bag (during the attack)

4. Anaphylaxis

- Urticaria(allergic rash) e.g. after playing football or after playing in the grass or after eating peanuts or eating in the restaurant
- Acute facial swelling
- Acute shortness of breath due to laryngeal edema
- Acute shock i.e. low BP and tachycardia
- May present with collapse
- Hoarseness of voice, wheeze, tongue swelling.

Treatment: IM adrenaline 1:1000 in anterolateral aspect of mid thigh

5. Foreign body ingestion

- Usually in children usually after playing with toys/coins and left unsupervised. Child previously fit and well.
- In adult while eating

Treatment: if patient is having shortness of breath now, then needs urgent laryngoscopy, but if no symptoms of air obstruction then do chest x-ray to check for foreign body in the GIT.

If foreign body below diaphragm then observe for the foreign body to pass with stool in 48 hours.

6. Carbon monoxide poisoning

- Usually due to leaking gas and several members of the family are effected
- It can be after house fire, black soot in nose, singed nasal hairs, black sputum
- Airway obstruction is due to laryngeal edema or inhalational burn leading to SOB.

Treatment: if any signs of inhalation injury (i.e. black sputum, singed nasal hair, soot in the mouth, hoarseness of voice) then needs general anaesthesia and intubation.

CHRONIC SHORTNESS OF BREATH

1. Congestive heart failure (CCF): This is both right and left ventricular heart failure

Signs of right heart failure=peripheral edema, enlarged liver, raised to jugular venous pressure or engorged neck veins, shortness of breath

Signs of left ventricular failure=pulmonary edema, shortness of breath

2. Mesothelioma

- Exposure to asbestosis e.g. shipyard worker
- Pleural effusion
- Pleural plaques

Investigation: Pleural biopsy is the best investigation

CT scan

3. Sarcoidosis

- Chronic shortness of breath
- Erythema Nodosum (a rash on the leg) on the lower limbs
- Chest x-ray shows bilateral hilar lymphadenopathy
- Raised calcium and raised ACE
- CT scan will show pleural effusion and pleural thickening.

4. Chronic anaemia

- Light headedness
- History of heavy periods (menorrhagia, prolonged periods or passing clots, normal periods usually last 3-5 days)
- History of per rectal bleed
- History of long term of non steroidal anti-inflammatory drugs e.g. ibuprofen, aspirin, naproxen
- History of long use of aspirin for heart problems or prophylaxis of stroke
- Shortness of breath and weakness
- Palpitations

Investigation: FBC to check for haemoglobin.

5. Cryptogenic Fibrosing Alveolitis

- This is an idiopathic disease meaning cause is not known
- Chronic fibrosis of the lungs, usually bilateral and its progressive
- It causes shortness of breath on exercise , the patient is usually hypoxic on exercise.

Investigation: Chest X-Ray shows reticulo-nodular shadowing, honey combing(late stage)

Treatment: Steroid

6. Extrinsic Allergic Alveolitis

- Shortness of breath which is intermittent depending on the exposure to the causative organism which is aspergillus fungus
- Common in farmers.

7. Cor Pulmonale

- Right ventricular failure secondary to lung problem commonly due to COPD or PE or pulmonary hypertension
- Peripheral edema, high JVP, enlarged liver, shortness of breath, ascites.

WHEEZE

1. ASTHMA

- Usually young patient or child
- Dry cough at night
- Wheeze and shortness of breath
- Precipitating factors like exercise, smoking, pets, dust
- There is usually history of atopy i.e. eczema, hay fever, asthma.
- Family history of asthma

2. COPD - please see above.

- Usually presents during an exacerbation
- Long standing history of smoking
- Middle aged man

3. BRONCHIOLITIS

- Child less than 1 year
- Bilateral wheeze with hyper-inflated lungs
- Fever, cough, running nose, cough, vomiting, sneezing, feeding difficulty
- Common in winters
- Caused by respiratory syncytial virus (RSV)

Investigation: Nose and throat swab.

STRIDOR

1. EPIGLOTITIS

- Usually a child
- Child is unwell and sick
- High grade fever e.g. 39 degrees
- Drooling of saliva
- Following people in room with eyes not moving their head

NB: there is no cough in Epiglottitis.

Management: Call anaesthetist and intubate

2. FOREIGN BODY - please see above

3. LARYNGEAL CARCINOMA

- Elderly patient with long standing history of smoking
- Pain in the ear
- Weight loss, anemia, anorexia
- Hoarseness of voice

4. LARYNGEAL OEDEMA

- Could be after house fire or anaphylaxis
- Please see above

HOARSENESS OF VOICE

1. Laryngeal carcinoma - please see above

2. Laryngitis

- Coryza symptoms (running nose, sneezing, cough)
- Fever

3. Functional dysphonia

- Usually in anxious people, can be triggered by emotions.
- Young female
- Sudden onset
- Can be exacerbated by laryngitis
- Triggered by emotions

4. Endocrine causes:

- Hypothyroidism (constipation, weight gain, bradycardia, cold intolerance, menorrhagia)
- Acromegaly (increased ring size or shoe size, weight gain, spaced teeth, protruding jaw-prognathism)

5. Singers nodule

- Usually in professional singers or teacher's

Investigation: Laryngoscope.

6. Voice abuse e.g. shouting especially at the football match/ cricket match or teachers

Treatment: reassure, no investigations required

7. Vocal cord paresis

- Trauma especially after endoscopy

8. Recurrent laryngeal nerve palsy.

- Usually after thyroid surgery
- Thyroid carcinoma especially anaplastic carcinoma (rapidly enlarging mass in neck)
- Aneurysm
- Enlarged Heart
- After long-term intubation

Treatment: usually resolves after some time, only needs reassurance

[APNOEA - cessation of breathing](#)

1. Opiate overdose:

- Small Pin-point pupils
- Puncture marks on the arm
- Slow respiratory rate <12 per minute.

Treatment: naloxone - short acting antagonist of opiates therefore may need to be repeated as the duration of action of opiates is longer than that of naloxone.

2. Breath holding spells in children

- Usually when they are upset and can be precipitated by trauma or when separated from the parents. Basically anything which may upset a child including falling down
- Usually, these children stop breathing for some time, they may turn blue or have little jerks of the limbs. Then they spontaneously start breathing after a short period of time and within 1 hour usually they completely fine.
- Usually there is a previous history

Treatment: Reassure

[ORTHOPNOEA](#)

This is shortness of breath when lying flat.

This is a sign of heart failure.

Patients usually use 3-4 pillows to help elevate the bedside and prevent shortness of breath.

Usually this is at night.

[CHEST PAIN](#)

- A. RESPIRATORY
- B. CARDIOVASCULAR
- C. MISCELLANEOUS

[RESPIRATORY CAUSES](#)

1. Pleurisy - Chest pain on inspiration, usually after pneumonia or after upper respiratory tract infection.
2. Bronchogenic carcinoma
3. Tension pneumothorax
4. Pneumonia
5. Pulmonary Embolism

[CARDIOVASCULAR CAUSES](#)

1. Myocardial infarction
2. Acute coronary syndrome

3. Ruptured Thoracic aortic aneurysm-excruciating pain usually radiating to the back.
4. Pulmonary embolism
5. Pericarditis - also chest pain worse during inspiration but relieved by leaning forward. ECG shows Saddle shaped ST elevation.
6. Stable angina-pain on exercise or exertion and resolves when you rest.
7. Unstable angina – chest pain at rest and as well as exercise. The chest pain not relieving by rest and have increased in severity or duration.

MISCELLANEOUS

1. Muscular skeletal pain - especially after strenuous exercise, usually there is tenderness on the chest wall.
2. Trauma - especially rib fracture
3. Costochondritis
4. Shingles usually between the ribs as it follows the intercostal nerves.
5. Gastro-oesophageal reflux disease: There is retrosternal chest pain when lying flat.

EXAMINATION IN RESPIRATORY MEDICINE

1. INSPECTION
2. PALPATION
3. PERCUSSION
4. AUSCULTATION

INSPECTION:

1. Central cyanosis means hypoxia:
 - This can be in any condition like Pneumonia, COPD or Asthma.
 - These patients are usually breathless and are using accessory muscle.
 - There is intercostal recession and sternal tug.
 - Investigations - Pulse oximetry and ABG.

2. PALPATION - WHAT TO PALPATE FOR?

- Trachea
- Chest tenderness
- Chest expansion

1. TRACHEA

- Central which is normal
- Deviated which is abnormal, but the question: Is the trachea being pushed or pulled?

Trachea can be pushed by:

- Tension pneumothorax
- Massive haemothorax
- Massive pleural effusion

Trachea can be pulled by:

- Lung collapse (Common)
- Pneumonectomy
- Lung fibrosis

TENSION PNEUMOTHORAX

- Common in young, thin males
- This is usually due to rupture of the large bullae and accumulation of air into the pleural cavity.

- Another precipitating factor is COPD
- Usually, there is hyper-resonance and reduced air entry on one side and trachea shifted on the other side.
- Chest expansion reduced on the same side as hyper-resonant and reduced air entry

COLLAPSED LUNG

- This will create an empty space
- There is reduced air entry on the same side where the trachea has been shifted.
- The trachea is being pulled by an empty space created by a collapsed lung
- Reduced Chest expansion on the same side, reduced air entry
- There is hyper-resonant on opposite to the side where there is reduced air entry, also reduced air entry on the same side.
- Could be due to foreign body, lung carcinoma, as a complication of major operation.

REDUCED CHEST EXPANSION

1. Should be equal on both side which is normal
2. Reduced unilaterally
3. Reduced bilaterally

CAUSES OF REDUCED AIR ENTRY UNILATERALLY

1. Pneumothorax
2. Pneumonia
3. Haemothorax
4. Pleural effusion

CAUSES OF REDUCED AIR ENTRY BILATERALLY

1. Pulmonary oedema secondary left ventricular failure (common)
2. Lung fibrosis especially cryptogenic fibrosing alveolitis

CHEST PALPATION:

Tenderness e.g.

- After trauma usually there is localized tenderness
- Shingles in which you will also find rash which run around the trunk following the nerves, usually shingles starts from back moving to the front of the trunk. Shingles is common in immune-compromised patients like elderly, patient on steroid, diabetic patient, HIV patient.
- Musculoskeletal pain usually after strenuous exercise in gym, especially on muscles

PERCUSSION - can be any of the following:

1. Resonant - which is normal
2. Hyper-resonant - which can be on one side or both side
3. Dullness either on one side or both side
4. Stony dull means pleural effusion.

CAUSES OF UNILATERAL HYPER-RESONANCE

- Pneumothorax is the commonest
- Large bullae

CAUSES OF BILATERAL HYPER-RESONANT

- COPD
- Bronchiolitis

CAUSES OF UNILATERAL DULLNESS

- Pneumonia
- Haemothorax
- Unilateral pleural effusion
- Lung collapse
- Lung abscess

CAUSES OF BILATERAL DULLNESS

- Left ventricular failure due to pulmonary edema

AUSCULTATION

1. Vesicular: normal heart sounds
2. Crackles: which can be either on one side or on both sides
3. Reduced air entry (reduced breath sounds) which can be either one side or both sides

REDUCED OF BREATH SOUNDS UNILATERALLY

1. Pneumonia
2. Lung abscess
3. Pneumothorax
4. Pleural effusion

REDUCED AIR ENTRY BILATERALLY

1. Left ventricular failure due to pulmonary edema, usually on the lung bases.
2. Congestive heart failure again due to left ventricular failure

BILATERAL CREPITATIONS

Pulmonary edema due to left ventricular failure especially at lung bases

UNILATERAL CREPITATION/ CRACKLES

1. Pneumonia (Commonest)
2. Lung abscess

INVESTIGATIONS IN RESPIRATORY MEDICINE**CHEST X-RAY FINDINGS**

1. Consolidation means pneumonia. Consolidation could be different.
 - Patchy consolidation can be either in mycoplasma or legionella
 - Upper lobe consolidation usually in tuberculosis, rarely in klebsiella
 - Bilateral interstitial shadowing usually in pneumocystis jiroveci
 - Bilateral cavitation usually due staphylococcal pneumonia
 - Upper lobe cavitation usually tuberculosis

2. Enlarged heart means heart failure
3. Widened mediastinum means dissecting aortic aneurysm (Thoracic)
4. Free gas in the mediastinum means ruptured/ perforated esophagus
5. Surgical emphysema means perforation of an organ e.g. esophagus
6. Gas under the diaphragm means perforated gastrointestinal tract (perforated peptic ulcer, perforation secondary to diverticulitis)
7. Bilateral fluffy opacities means pulmonary edema due to left ventricular failure.
8. Bilateral hilar lymphadenopathy in Sarcoidosis

ARTERIAL BLOOD GAS

pH.....7.35-7.45
 PaO₂..... >10
 PaCO₂.....4.5-6
 HCO₃.....22-28

CO₂ is an acid and its controlled by the lungs therefore its respiratory problem
 HCO₃ is an alkali or base, its controlled by the kidneys its therefore metabolic problem
 Low PH means acidosis caused by high CO₂ and Low HCO₃
 High PH means alkalosis caused by high, HCO₃ and Low CO₂
 If base excess is negative it means acidosis, if it is positive it means alkalosis.

Please follow the following steps in the interpretation of blood results:

1. Look at the pH - if it is low it is acidosis and if it is high it is alkalosis. Therefore, this step is to decide either this is acidosis or alkalosis.
2. Look at the PaCO₂ - if it can explain the pH then it is respiratory, if CO₂ cannot explain it then it is metabolic. Therefore, this step is to decide if this is respiratory or metabolic.
3. Look at the HCO₃ to confirm your findings to step 2 and also to check if there is compensation.

COMMON ACID BASE BALANCE ABNORMALITIES

1. **Vomiting** - you lose HCl, so patient will have metabolic alkalosis and hypokalemia
2. **Diarrhea** e.g. gastroenteritis - loose salts, therefore patient will have metabolic acidosis. NB: diarrhea also results in hypokalemia and hyponatremia.
3. **In Villous adenoma**- you lose potassium, therefore patient will have hypokalemia
4. **Diabetic acidosis** cause metabolic acidosis
5. **Metformin** causes lactic acidosis
6. **Salicylates** overdose metabolic acidosis.
7. **Alcohol** causes metabolic acidosis

From the arterial blood gas you can also work out the type of respiratory failure.

Respiratory failure is oxygen PaO₂ <8.

Respiratory failure type 1 is oxygen less than 8 with normal or low PaCO₂, this can be caused by PE, pneumonia.

Respiratory failure type 2 is oxygen < 8 with high CO₂, this can be caused by COPD.

In type 1 respiratory failure give 100% oxygen or highest available % of oxygen or 15 L/min.

In type 2 give 24% oxygen via venture mask. The commonest cause of type 2 respiratory failure is COPD.

PNEUMONIA

Lower respiratory tract infection, also called chest infection.

Symptoms:

- Fever, cough, shortness of breath, sputum, chest pain.

Investigation is chest X-ray showing consolidation, indicating pneumonia.

Sputum culture is rarely done in the UK for common pneumonia, most of chest infection are treated empirically.

Treatment is antibiotics commonly empirical treatment

SPECIFIC PNEUMONIA'S**1. COMMUNITY ACQUIRED PNEUMONIA**

- Commonest cause is streptococcal pneumonia, also called pneumococcal.
- Commonly after recovering from streptococcal pneumonia people usually develops herpes labialis, therefore if you see herpes labialis or cold sore, its likely to be streptococcal pneumonia
- Chest x-ray simply shows consolidation

Treatment is amoxicillin or co-amoxiclav or benzylpenicillin

2. Staphylococcal pneumonia

- Usually develops after viral illness i.e. upper respiratory tract infection, influenza.
- Chest x-ray shows consolidation and sometimes bilateral basal cavitation
- Therefore, if someone has pneumonia after a common cold means he has staphylococcal pneumonia.

Investigation: Chest x-ray

Treatment: Flucloxacillin, if MRSA resistant use vancomycin.

3. Aspiration pneumonia:

Usually in alcoholics after binge drinking and they aspirate the gastric content, sometimes after swallowing problems like stroke, parkinsonism, motor neuron disease (i.e. swallowing difficulties).

4. Haemophilus Influenza (Gram positive bacilli)

- Usually causes infection in bronchiectasis and COPD.
- For bronchiectasis there might be history failure to thrive, recurrent chest infection as a child suggesting cystic fibrosis, which is a common cause of bronchiectasis due to recurrent infection.

Investigation: Chest x-ray

Treatment: 1. Clarithromycin or 2. Erythromycin or 3. Tetracycline

5. Pseudomonas Aeruginosa

- Commonly causes infection in COPD and Bronchiectasis

Investigation: Sputum culture

Treatment: Ciprofloxacin, anti-pseudomonas, meropenem

6. Tuberculosis

- Patient from African or Asia
- Weight loss, haemoptysis, night sweats, productive cough.

- Cervical lymphadenopathy
- If patient is not from Africa or Asia then there will be history of alcoholism and he is homeless.

Investigation: Sputum culture and microscopy for TB. Or test for Acid fast bacilli or ZN stain.

7. Klebsiella

- Causes infection in elderly, alcoholic and diabetics.
- Usually causes upper lobe cavitation.

Investigation: Chest x-ray - upper lobe cavitation.

Treatment: Cefotaxime or imipenem

8. Hospital acquired pneumonia

Is usually caused by gram negative bacilli (Klebsiella, E. Coli, Proteus) or pseudomonas or staphylococcal.

9. ATYPICAL PNEMONIAS: all of them have got dry cough.

i) Pneumocystis Jiroveci

- HIV patient, or homosexual or IV drug abuser or from Africa
- Weight loss, lymphadenopathy
- Low CD count,
- Prophylaxis for pneumocystis carinii is recommended if the CD 4 count falls below 200.
- Bilateral perihilar interstitial shadowing

Treatment is cotrimoxazole

ii) Legionella Pneumophila

- Dry cough, history of travel abroad or staying in a hotel
- Confusion and diarrhea is common in legionella
- Legionella causes hyponatremia.

Investigation: Chest x-ray = patchy consolidation. Also you can do urine antigen for legionella.

Treatment is clarithromycin or erythromycin

iii) Mycoplasma Pneumonia

- Flu-like illness
- Dry cough

Investigation: Chest x-ray will show patch consolidation. Also cold agglutinin test is positive (clotting of RBC's)

Treatment: clarithromycin or erythromycin or tetracycline

iv) Chlamydia psittacci

- Dry cough
- Contact with birds or works in a parrot shop

Investigation: Chest x-ray

Treatment: Tetracycline or Clarithromycin

v) Chlamydia Pneumophila is also treated with tetracycline.

ASTHMA

Asthma is an allergic inflammatory airway reaction characterized by reversible airway obstruction, bronchoconstriction leading to dry cough, shortness of breath and wheeze.

Symptoms:

- Dry cough especially at night
- Wheeze
- Shortness of breath
- Usually there is family history of asthma or history of atopy i.e. asthma, eczema and hay fever.

Precipitating factors:

smoking, pets, dust, viral illness, exercise, aspirin, NSAIDs.

Management of asthma depend so on the probability.

Low probability of asthma is symptoms associated with cold. If there is low probability then patient needs to be investigated to make sure the diagnosis is clear.

High probability of asthma is symptoms associated with exercise, or 3 or more symptoms or if family history of atopy or if past history of atopy. If high probability you give trial treatment before you treat even without investigations.

Prophylaxis

1. **Avoid triggers**
2. **Use sodium chromoglycate in exercise induced asthma or pre-exercise bronchodilator (salbutamol)**

Treatment:

1. **Stable patient: Goes to GP or outpatient department (salbutamol)**
2. **Unstable patient: Patients come to A&E and have severe symptoms**

A. Stable patient

Step 1: Occasional short acting beta 2 agonist inhaler e.g. salbutamol as required. If needed > 2/week or (night symptoms) or if getting exacerbation move to next step.

Step 2: Add regular Inhaled Steroid: Therefore at this stage child will be taking salbutamol as required and inhaled steroid e.g. beclomethasone 200 micrograms, if not helping go to 800 micrograms, if still not resolving then go to step 3.

Step 3: Check diagnosis, check technique (use the spacer with a mask). Add 1 dose monteleukast (leucotriene antagonist) in the evening. If 2-5 years, add leukotriene antagonist (e. g. monteleukast), formeterol. If <2 years refer to the paediatrician.

If child > 5 years add Long acting – agonist e.g. salmeterol. At this stage if not getting any benefit from long acting beta-agonist then discontinue it. But if it has added some benefit then continue it.

Step 4: Increased inhaled steroid up to maximum dose (e.g. Beclomethasone 800 µg --- 2000 µg). If child develops oral candida reduce the dose.

At this stage also consider leukotriene antagonist if not already used or modified long acting beta agonist or aminophylline

Step 5: Add prednisolone – oral

A. Unstable patient = Acute exacerbation of asthma

- a. **Mild to moderate asthma (able to talk, Pulse < 125, PEFR > 35% of the predicted value. Oxygen > 92%.**

Treatment:

1. **Oxygen**
2. **Nebulised salbutamol 5mg every 15-30 minutes or terbutaline**
3. **Prednisolone**

- a. **Severe asthma (can not speak in complete sentences in one breath or child too breathless to speak, PEFR 35%-50%, Oxygen saturation < 92%)**

Treatment:

1. **Oxygen**
 2. **Nebulised Salbutamol 5mg every 15-30 minutes ± IV salbutamol**
 3. **Oral Prednisolone 40-50 mg or hydrocortisone 100 mg IV**
 4. **MgSO₄**
 5. **Aminophylline after talking to ITU**
- a. **Life threatening asthma: (Silent chest, cyanosis, hypotension, bradycardia, agitation, reduced consciousness, saturations < 92%)**

1. **Oxygen**
2. **Nebulised Salbutamol ± IV salbutamol**
3. **Prednisolone or hydrocortisone**
4. **MgSO₄**
5. **Aminophylline**

PREVENTION OF ASTHMA

1. **Stop smoking**
2. **Avoid allergens (pets, dust)**
3. **Use sodium cromoglycate for exercise induced asthma or pre-exercise bronchodilator. If you have both options in the question choose sodium cromoglycate.**
4. **Avoid infection**

PULMONARY EMBOLISM

- **Usually young female with risk factor e.g. history of long flight or on combined contraception.**
- **Sudden shortness of Breath, sudden chest pain.**
- **Haemoptysis**
- **Shortness of breath**

RISK FACTORS OF PE:

Malignancy, pregnancy, post operative especially hip operation and hysterectomy, combined oral contraception pills, long flight

Management of Pulmonary embolism

You need wells score.

Well's score

1. Entire leg swelling ----- +1
2. Calf swelling more than 3 cm----- +1
3. Active malignancy----- +1
4. Immobilization more than 3 days---- +1
5. Pitting edema----- +1
6. Collateral superficial veins----- +1
7. Calf circumference more than 3 cm compared to other leg--- +1
8. Other diagnosis likely----- -2

Low probability=0 or less points

Intermediate probability 1-2 point

High probability 3 or more

Management:

1. **Low probability --- do D-dimer first**

If D-dimer negative then PE has been ruled out

If D-dimer positive ---> start low molecular weight heparin ---> investigate with V/Q scan ---> if confirmed continue treatment and add warfarin. If V/Q scan negative stop the low molecular weight heparin.

2. If intermediate or probability ---> start treatment with low molecular weight heparin ---> investigate with V/Q scan if confirmed continue treatment with low molecular weight heparin and add warfarin, if negative then stop the treatment.

If confirmed PE then continue both low molecular weight heparin and warfarin and stop heparin when INR reaches 2. You then continue warfarin maintaining INR 2-3.

NB: In pregnancy, you use low molecular weight heparin, as warfarin is teratogenic.

Investigations in Pulmonary embolism

1. V/Q scan this is the most appropriate investigation as it expose patients to less radiation but it can only be done if CXR is normal. So if the question says CXR is normal then definitely choose V/Q scan
2. Pulmonary angiogram is the most definitive investigation and the gold standards.
3. CTPA is better than V/Q and if chest X-ray is abnormal it is always preferred.
4. D-dimer choose only if there is low probability of PE, do not choose if intermediate or high risk. Also if patient is post-operative D-dimer is not used.

NB: Maintain INR between 2-3.

TENSION PNEUMOTHORAX

As discussed earlier develops in young tall, thin men.

Please see above under the section of examination.

Investigation is Chest x-ray

Treatment: Wide bore needle or cannula in the intercostal space. This is also called needle decompression.

If none of the above are in the options, then you can choose chest drain.

CYSTIC FIBROSIS

- This is congenital disease affecting new born babies. it is an autosomal recessive condition and there is 1:4 or 25% chance that the other next child will be affected.
- It is chloride channel defect
- As a baby there is history of recurrent chest infection, meconium ileus, failure to thrive.
- Usually at the age between 18-30 the patients develop bronchiectasis as a complication. Therefore watch for the age of the patient.

Investigation: sweat test.

Treatment is symptomatic: physiotherapy, antibiotics for infection.

COPD - Chronic Obstructive Pulmonary Disease

There are 2 types COPD: emphysema type and chronic bronchitis.

This is due to smoking, therefore there is long standing history of smoking.

- Usually middle aged men 35-50.
- Look at the age of the patient because long history of smoking, if elderly patient malignancy is more likely than COPD.

Investigation: Respiratory function test.

Treatment: steroid inhalers and bronchodilator

Patient with COPD usually develops type 2 respiratory failure and therefore do not give 100% oxygen. Give 24% oxygen by venturi mask and do an ABG.

If the amount of CO₂ on 28% is increasing, then reduce to 24%.

Type 2 respiratory failure is when oxygen is less than 8 and CO₂ is high (above 6).

Type 1 respiratory failure is when oxygen is less than 8 and CO2 is normal or low.

ASPERGILLUS

Causes extrinsic allergic alveolitis -

- There is intermittent shortness of breath depending on the exposure.
- It is due to exposure to aspergillus clavatus - a fungus.

Treatment: anti-fungal e.g. amphotericin

Aspergillus can cause asthma as allergic reaction due to exposure and as well it can as a complication in Asthma.

LUNG CANCER

- Usually elderly patient with chronic history of smoking
- Weight loss, anorexia, anaemia
- Usually this is bronchogenic carcinoma
- Progressive or worsening shortness of breath, haemoptysis
- Small cell lung cancer can cause SIADH with low Na and high ADH. Also, cushing's syndrome can be cause by small cell cancer.
- Squamous cell carcinoma causes hypercalcaemia

Investigations: Bronchoscopy for bronchogenic carcinoma. CT-scan of the chest for carcinoid.

BRONCHIECTASIS

This is permanent dilatation of the bronchi due to recurrent chest infection.

Causes: cystic fibrosis, recurrent infection.

Symptoms: chronic cough, copious purulent sputum, intermittent hemoptysis

Investigation is high resolution CT scan

Treatment: postural drainage, physiotherapy.

Give antibiotics if chest infection.

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