

Case 2

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Respiratory case 2

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12 year old child admitted with cough and shortness of breath for 4 days duration.

He had a recent URTI 3 days ago

He had similar previous episodes over past 4 years in winter seasons .

Question 1

1-What are important questions you should ask in history ?

Mention anything relevant in :HOI,ROS,Past medical ,Birth ,Social , Vaccination, drug hx

For discussion see notes below

Notes

Hx of present illness :

1-Cough :

-Onset ,course ,progression : gradual onset , intermittent increasing in frequency and intensity over past 24 hours

-Nature : Dry

-Character :Dry no specific character ,non paroxysmal

-Diurnal variation : worse at night (after midnight and during early hours of morning)

-Severity of cough :

cough disturbs sleep ,child sits right at night ,interferes with physical activity and missed 2 days of school .

cough sometimes followed by vomiting (post tussive) ,associated with dyspnea and chest tightness

-Aggravating factors : Aggravated by exercise , laughter or crying ,usually have cough when exposed to smoking, perfumes, detergents

-Relieving factors : cough relieved by using his puffer ,or nebulizers at ER visits

2-Associated symptoms :

-Shortness of breath ,worse over the past 24 hours

-Wheeze(whistling sound) ,usually appears when Child breathes out .

-Chest tightness expressed by child when short of breath

No Cyanosis

-Symptoms of URTI 3 days ago : sneezing , nasal discharge

3-Relevant questions :

-Fever : felt warm 2 days ago ,resolved ,not documented
-previous similar episodes in the past ,last episode one month ago , also had similar episodes during winter season for the past 5 years since ion .to ER for nebulizers he was 7 years old .admitted to hospital two times for his condition.

-positive hx of similar condition in his older brother and his mother

--The child has eczema on his arms and legs

--He also has nasal discharge ,sneezing and itching from the eyes specially in spring seasons

--his father is a smoker

--the have a first floor house with few olive trees around .

---He uses a puffer ,blue in color whenever he has symptoms not in daily basis .

R.O.S :

-ENT : has symptoms of nasal congestion /blockage ,sneezing in spring .

-Heart : no symptoms of CHF ,no cyanosis ,no extensional dyspnea unless having an attack of coughing and wheezing , he feels some palpitation after taking his blue puffer when unwell .

-GI : no diarrhea ,no vomiting (unless post tussive) ,no heartburn

-CNS : free ,

-Skin : has eczema since early childhood : red itchy scaly areas around elbows and knees

Past Medical :

Two admissions to hospital with similar attacks ,for 2 to 3 days , received O2 and nebulizers and some injections

Multiple ER visits with less severe episodes

No PICU admissions

No regular follow up at pediatric or chest clinics

Past surgical :

Underwent tonsillectomy at age of 5 for recurrent ENT infections

Medications :

Receives frequently antihistamines syrup for nasal symptoms

Uses a blue puffer when unwell ,but this time did not help much , not compliant on any other inhalers on daily basis

Uses his puffer directly through the mouth without a spacer

Social hx :

Father smoker , no pets at home

First floor apartment with olive tree around the house

Some humidity (molds) on the wall reported by his mum more in winter

“Should comment on income ,job and educational level of parents “

Vaccination :

Given his vaccines up to age as per MOH ,Jordan

Not given flu vaccine this year

Not given the pneumococcal conjugated vaccine

Growth :

Growing well ,parameters on 50th percentile

Development :

Good school performance ,however affected while unwell .

Nutrition :

breast fed for 3 months then formula when young . Now regular table food

No hx of food allergies

Question 2

-What are important findings you should look for in Physical Examination ?

Please observe video below ,

<https://www.bing.com/videos/search?q=video+physical+examination+for+a+child+with+asthma&&view=detail&mid=1716B617D91DA36B8E271716B617D91DA36B8E27&rvsmid=25C76EB9BD41A07D6EE925C76EB9BD41A07D6EE9&FORM=VDRVRV>

Notes

Please refer to the link for demonstration of physical examination for a child with respiratory problem

Comments :

-General condition :alert ,responsive ,can complete a sentence or not ,comment if on nebulizer or supplemented with O2 therapy

-Comment if audible wheeze or stridor noted

-Observe for signs of respiratory distress (tachypnea,tachycardia ,cyanosis,retractions ,use of accessory muscles ,flaring of nostrils, increased work of breathing

-LOC : alert (agitated irritable which occurs with Hypoxemia (occurs early in an attack) or drowsy (narcosis : CO2 retention ,late severe stage of distress)

-Vital signs and SPO2 : RR ,PR,Temp ,Blood pressure (pulsus paradoxicus)
SPO2 % his sat is 87% Room air (normal > 93%)

-Skin : eczema

-Fingers : no clubbing

-comment on growth parameters or dysmorphism

-

-ENT : positive PND (post nasal drip) hyperemic throat ,clear tympanic membranes

-Chest :

-Inspection ,Palpation ,percussion ,auscultation : findings :

Chest :

-Inspection ,Palpation ,percussion ,auscultation : findings :

Child has some signs of respiratory distress

Hyperresonant chest

Bilateral diffuse expiratory wheeze

Diminished air entry

Prolonged expiratory phase

Relevant Organs :

-Liver :

Palpable 1 finger below costal margin

But liver span performed by percussion found to be normal

Why is this ?

Due to hyper inflation of lungs which pushes the liver downward

-Hear :

Comment on S1 S2 no S3 no gallop no murmur

Why important (e.g 1- Left sided CHF can cause respiratory symptoms (pulmonary edema) ,
2-chronic respiratory illness (fibrosis ,bronchiectasis) can cause Rt sided heart
failure :cor -pulmonale)

The following are signs found in this child can you comment ?



Notes

Signs :

1-Nasal polyposis : usually present in adults with asthma triad (aspirin sensitivity, asthma, nasal polyposis)

But rare in younger children with asthma ...if present at an early age ;suspect CF ,ciliary dysfunction.

2-sniffing signs for children with allergic rhinitis

3-Allergic shiners : dark halos around the eyes for allergic rhinitis (+/_ allergic conjunctivitis)

4- Eczema on extensor surfaces

Question 3

What important investigation should be performed for this child ?

See notes/discussion below

Notes

Depends on clinical status

1-If Child comes to the clinic with chronic or episodic symptoms and stable :

If symptoms and P/E suggestive of reactive airway disease and the child has no warning signs to suggest other diagnosis then you are making a clinical diagnosis without needing investigations before you can start treatment .

However ,some investigations are needed if available to evaluate : severity , response to treatment , assess for presence of atopy or screen for co morbidities .

1- Chest Xray :

Not necessary to dx asthma but indicate if warning /atypical signs and symptoms

(e.g : chronic wet cough ,

repeated chest infections ,

prolonged fever with respiratory symptoms ,

clubbing ,

asymmetrical findings on auscultation ,inspiratory crackles or inspiratory wheezeetc)

or if child comes to ER with severe distress and you need to look for complications like (pneumothorax ,atelectasis, pneumonia ..)

2- Lung function test :

spirometry it confirms asthma if pattern is obstructive (small airway obstruction with bronchodilator reversibility > 12% in FEV1

2- Lung function test :

spirometry it confirms asthma if pattern is obstructive (small airway obstruction with bronchodilator reversibility $> 12\%$ in FEV1) : FEV1 $< 80\%$ predicted , FVC normal ,FEV1/FVC $< 80\%$, however ,normal spirometry is commonly seen in asthmatic children when well and does not exclude asthma ,

usually performed for cooperative children ,above 7 years of age .

3-Allergy tests :

e.g skin prick test for inhaled allergen sensitizations. Positive test means child has atopy ,helps to identify then avoid triggering allergens if present Other tests :RAST for specific IgE response

4- CBC ,usually not indicated unless you are looking for eosinophilia in atopic asthma , or leukocytosis if infection or pneumonia suspected .

5-**Total IgE** ,if atopy is suspected ,not of clinical benefit unless your patient is severe persistent not responding to treatment or keeps relapsing and you are considering anti – IgE therapy ,or other immune therapy , or suspecting ABPA (allergic bronchopulmonary aspergillosis)

6- **Vitamin D** can be ordered if poor response to treatment to screen for vitamin D deficiency ,it has been shown to have important immune modulatory and anti inflammatory effect .

7-Scintigraphy : contrast study for swallowing if chronic aspiration is suspected as a cause for cough and wheeze or repeated chest infections

8- PH study ,if GERD is suspected to aggravate asthma or is the primary cause for chronic cough specially if symptoms related to food

Consider other tests if indicated : e.g

1- CT chest if other DDX suspected (bronchiectasis ,CF ,interstitial lung diseaseOr for remodeling of airways if chronic persistent asthma in adolescents or adults

2- Echo :if cardiac asthma is suspected

3- Bronchoscopy ; if poor response to treatment ,DDX is suspected like severe airway malacia or congenital stenosis of airways , or foreign body .. Or to obtain culture if suppurative lung disease is suspected

4-Immune testing ,when indicated if recurrent pneumonia is considered

In acute settings at ER :

Most important is to assess for SPO2 CXR : when indicated (not for every attack)
a blood gas is indicated if severe respiratory distress is present

This is the child's CXR ,what is you interpretation ?



**hyperinflation : more than 6 and 8 ribs ant and post respectively
flattening of diaphragm ,both domes are parallel to each
other ,right is pushed downward by hyper inflated lungs
narrow medistinuam
Increased lucency of lung fields**

SPT to common inhaled allergens



SPT skin prick test positive when a weal is more than 3 – 4 mm

Anti histamine medications should be stopped 5 days prior to test

Spirometry

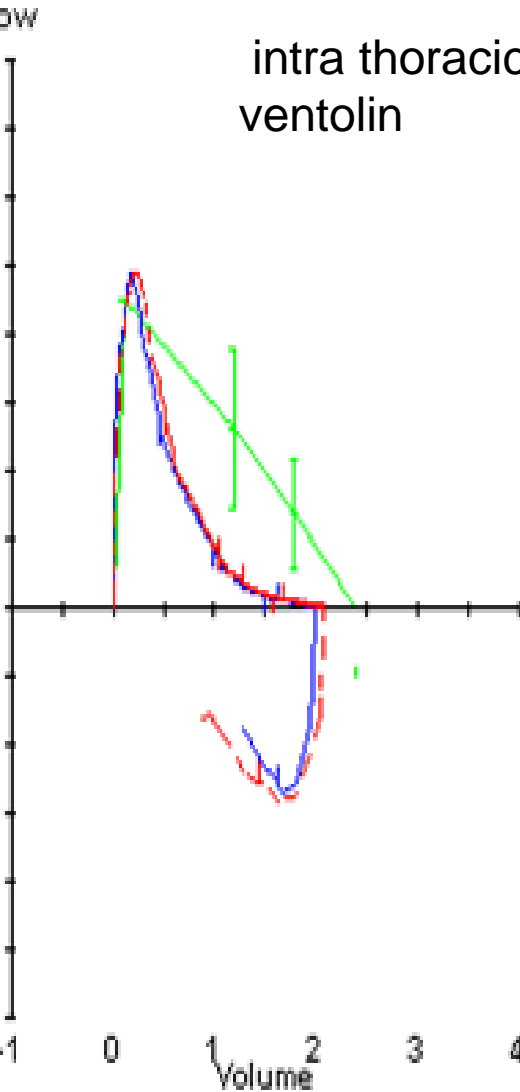


This is a flow volume loop for this child , what is your interpretation ?

low FEV1 low FEV1/FVC normal FVC

intra thoracic obstruction , no response to ventolin

Spirometry



| | | Ref | Pre Meas | Pre % Ref | Post Meas | Post % Ref | Post % Chg |
|-----------|--------|------|----------|-----------|-----------|------------|------------|
| FVC | Liters | 2.40 | 1.99 | 83 | 2.09 | 87 | 5 |
| FEV1 | Liters | 2.25 | 1.28 | 57 | 1.31 | 58 | 3 |
| FEV1/FVC | % | 86 | 64 | | 63 | | |
| FEF25-75% | L/sec | 2.64 | 0.57 | 22 | 0.54 | 20 | -5 |
| FEF50% | L/sec | 2.58 | 0.87 | 34 | 0.79 | 31 | -9 |
| PEF | L/sec | 4.50 | 4.87 | 108 | 4.90 | 109 | 1 |

200
150

% PREDICTED

Q 4 : what is your DDX

What is your DDX

What is the most likely Dx

Explain ,discuss

See notes ,discussion below

Notes

Most likely dx is bronchial asthma why ?

Typical signs and symptoms ,repeated previous episodes ,seasonal variation ,presence of atopy and family history
spiromerty ,chest xray findings ...etc

Less likely DDx :

1-Cystic Fibrosis : no GI manifestations ,child growing well ,normal chest film ,no clubbing ...etc

2-Primary ciliary dyskinesia : present with nasal polyposis (not present in this child) ,recurrent draining ears with tubes in place , may have dextrocardia ,clubbing .bronchiectasis 1...etc

3-GERD : No GI symptoms

4-FB aspiration ,, hx not suggestive as no choking ,wheeze and hyperinflation often localized ,though not necessarily

Refer to lecture for other DDx

Question 4

What treatment should this child receive ? •

Discuss •

See notes below •

Notes

Treatment of bronchial asthma is divided into acute (rescue) and control (prevention)

In acute settings :

O₂ 100 %for hypoxemia and respiratory distress

Rapid-acting beta₂-agonists as needed for symptoms

Short course of systemic steroids

Ipratropium Bromide nebulized

For control ,and prevention of future episodes : according to GINA guidelines (see lecture) step up approach according to the severity and frequency .

Medications used for control :

ICS inhaled corticosteroids : first choice in children

LTRA leukotriene receptor antagonists

Combination LABA/ICS Long acting b agonists

Cromolyn/Nedocromil

Methylxanthines:Theophylline

Sytemic steroids

Methods of inhaled medications delivery options



1-Metered dose inhaler and a spacer

2-Dry powder inhalers

3- Nebulizer machines

