Asthma

- URT damage or infection
- damage to Bronchi and Bronchiole
- cause chronic inflamation to Airways

↓

making it narrower and difficult to breathe.

- People with asthma.

↓

leads to asthma attack

↓

usually triggered by something in the enviornment which cause Immune cell to generate inflamation in the lungs which can make them even narrower and life threatening.

⇒ Now,

In Bronchiole ⟹ Trachea

↓ ↓

lumen

Innerlining of epithelial cell ——— } → Mucosa

lamina Propria ——— }

Smooth muscle lines ——— → Sub-mucosa

In Asthma ⟶ there are typically lots of eosinophills just below the epithelium in the lamina propia

Eosinophills are WBC ⟶ that carry Cargo of Granules

↓

full of soluble chemical mediators

↓

like Histamine, Prostaglandin, P. Activating factors and

↓

when these eosinophils sense a enviroment triggers like smoking (cigrote smoke)

⇒ They can release their granules ◉ → ⁘

↓

These chemical mediators spill out and start degrading lipid, protien and Nucleic acid (RNA, DNA)

↓

Destroy all the Major cell components

↓

This creates a strong Inflamatory even. in the bronchials and causes 2 changes.

(A) Smooth muscle around the start to spasm which narrows the airways.

BRONCHIOLE

(B) (1)se Mucous secretions into these narrows airways and narrowing them even more.

((A) and (B) combine → really hard to breathe.)

↓

That's why it is considered as Obstructive Pulmonary Disease.

⇒ Initially these inflamatory changes are completely reversible but over the years Irreversible changes start to take place

↓

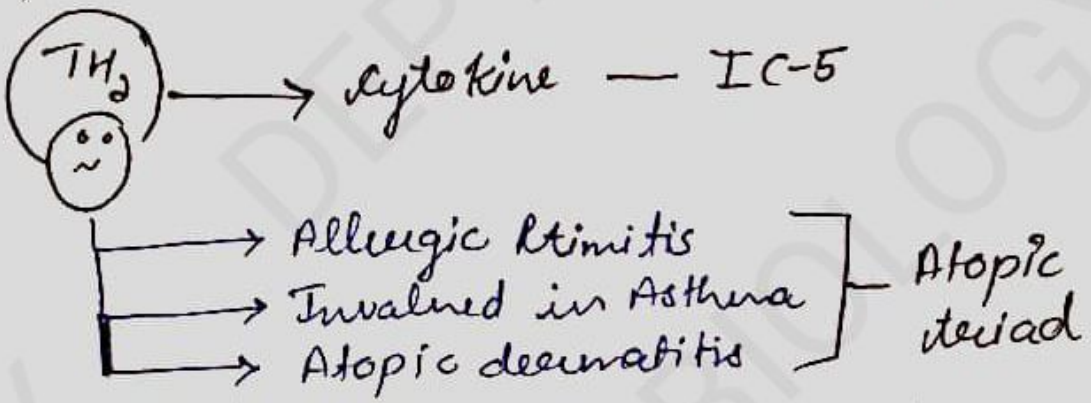
Edema, scaring and fibrosis build up and leading to thickening of the epithelial basement membrane

↓

which permanently reduces the airway diameter.

⇒ Now, why ☺? [DEPTH OF BIOLOGY]

Type 2 Helper T cell (TH_2) Immune cell sub types.



•These TH_2 cells release cytokine ⟶ to communicate with other cells

↓ [DEPTH OF BIOLOGY]

*One cytokine is Interleukin 5 which is a small peptide that attracts and activates esinophills.

⇒ So,
Blocking in Interleukin 5 ⟶ relief in ⟶ Asthma Patient.

⇒ some patient with Asthma with low level of TH_2 cell

↓

But high level of another class of Immune cell Neutrophi-lls.

↓

Highly Inflam. Phagocytic cell [DEPTH OF BIOLOGY]

↓

It gobble up infected or dead cells. [DEPTH OF BIOLOGY]

How Neutrophills promote Asthma ?? - Unknown

But another interleukin - Interleukin 8 released by neutrophills play a key role in the disease.

↓

Patient of Neutrophills disease tend to have a more severe form of Asthma.

Causes :- unknown [DEPTH OF BIOLOGY]

It may be caused by combination of **Genetic** and environmental factors.

due to genetic factors → certain genes identified

↳ (childhood Asthma → 12 years)

Environmental factors

↳ leads to later onset of Asthma.

Hygiene Hypothesis → Reduced early immune system exposure to Bacteria and Virus

↓

might actually (↑) the risk of later developing Asthma.

Triggering Substance →

① Air Pollution → Cigrate Smoking
→ Car exhaust.

② Allergens → Dust, Pet tender and Mould.

③ Medication → Aspirin / Beta Blockers] also triggers symptoms.

Symptoms :-

- coughing [DEPTH OF BIOLOGY]
- wheezing sound

- Feeling of Chest Tightness
- Dyspnea
- In sputum → Curschmann spirals

↓

elongated mucous casts (seeing in people with Bronchial Asthma) ← It is very dangerous because mucus stop both air and Medication

Asthma can be classified According to frequency of Symptoms.

[DEPTH OF BIOLOGY]

Night time ← → Early Morning

* FEV1 → Forced expiratory Vol. in 1 sec.
* PEFR → Peak expiratory flow Rate
* Freq. of Medication used.

] Measure amount of obstruction in airways.

Types →

① Intermmitten Asthma → Mild Persistant Asthma

↓

Moderate Asthma → severe Persistant Asthma.

Treatment → No Cure [DEPTH OF BIOLOGY]

↓ we try to manage its symptoms and AVOID of Asthma attack.

① People with Asthma avoid contact which Triggers substances

↓ By

- → vaccuming
- → removing carpet and rugs.
- → changing the environmental condition. [DEPTH OF BIOLOGY]

② Medications →

① Bronchodilators ② Anticholinergics

① Bronchodilatores — Like short acting beta adrinoreceptor agonists

② Anticholinergics — This cause smooth muscle to relax (lungs)

In severe cases

- Daily corticosteroids
- long acting B-adrinoreceptor agonists:
- leukotriene antagonists.

Very severe cases —

- Intravenous corticosteroid $MgSO_4$ and
- oxygen therapy might be needed.