

Typhoid

[DEPTH OF BIOLOGY]

Caused by Salmonella Typhi

→ Facultative Intracellular Pathogen

They Have Flagella

Encapsulated

Rod
Shaped

Gram
-ve

Mean they Lives Inside & outside the cell.

⇒ Once Salmonella → enter in Body (through Contaminated food & H₂O).

It Target the epithelial Layer of mucosal Lining. → reaches to Distal Ileum

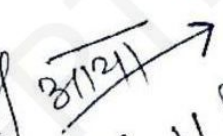
Here, M-Cell  Enter into Intestinal Lumen.

Bacteria used

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⇒ S. Typhi has VI Capsular Polysaccharide Antigen Virulence factor.

→ This factor Help the Bacteria from being Intact with Antibody.

Neutrophil  but can't Interact

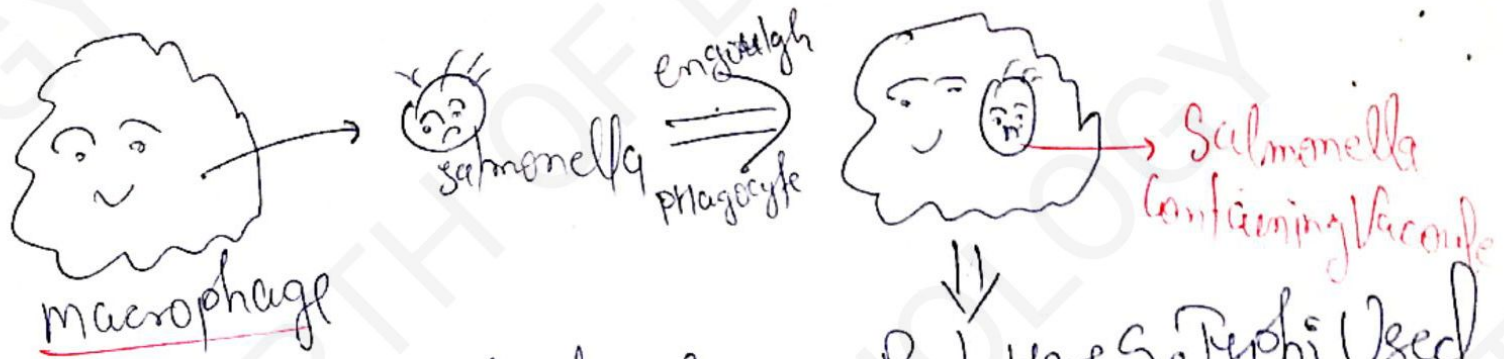
so our Body's Immune system send monocyte & Macrophage at the site of Infection.

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Lead to Damage Epithelial Lining & Lead to Ulcer Perforation.

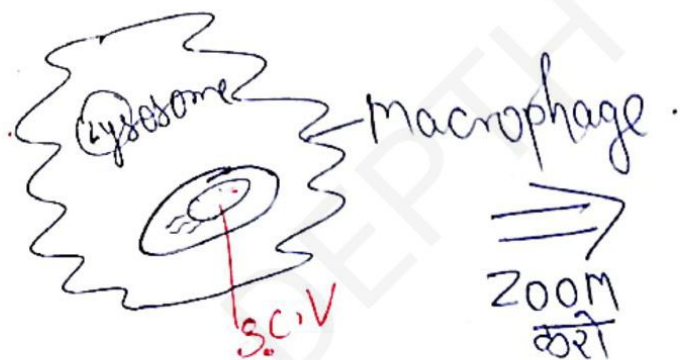
↓
After reached they caused Hypertrophy & Necrosis of the surrounding tissue.

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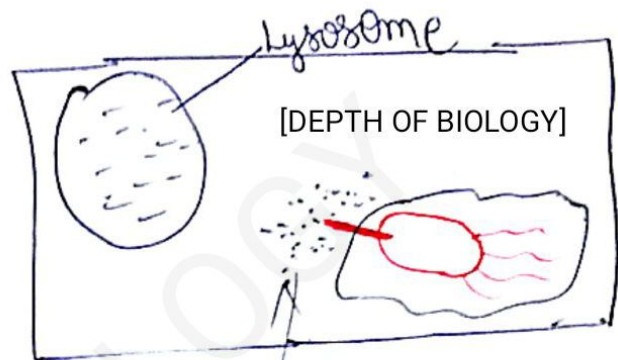


⇒ Generally vacuole fused with lysosome. Hydrolytic enzymes & damage & destroy.

⇒ But Here S. Typhi Used Needle Like protein called Type - **III** secretion system.



⇒
Zoom
करते



Needle Like protein Inject a variety of effector protein across the vacuole Membrane. → & enter the Host Cell Cytoplasm.

So it prevent fusion b/w lysosome & S.C. vacuole

Lead to remodeling of vacuole

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So S. Typhi survive & replicates in vacuole.

Now, Macrophage Continue to flow through the thoracic duct into lymphatic system

Liver
Spleen
Gall Bladder
Bone Marrow
Lymph Node

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At this point S. Typhi Induces Macrophage Apoptosis / or cell death.

→ So If WBC death Bacteria release into blood stream.



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Bacteria released into blood stream called Bacteremia

Lead to systemic vasodilation

Lead to **SEPSIS** (Life threatening)

(Vital organ affect) Hypoperfusion

↓
Organs are not get enough Nutrient & O₂ rich Blood

⇒ Some people can Chronic Infected with S. Typhi.

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Lifetime → Bcz. S. Typhi remains in Gall bladder
even symptom disappear

Excreted in faeces ← Intestine Bile duct.

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Symptoms ⇒

Appear 1-2 weeks after Infection.

& Take 4-6 Weeks to resolve

⇒ Confused Mental state.

⇒ High fever

⇒ Abdominal pain

⇒ Constipation

⇒ Salmon = Coloured spot on Chest/Abdomen.

⇒ If Infection spread Lead to Hepatomegaly & Splenomegaly.

⇒ Weakness ⇒ Headache ⇒ Dehydration.

Diagnosis $\Rightarrow$ ① Culture from blood, ② Stool culture
2nd week of Infection. $\downarrow$ ④ Widal Test.
③ Bile Culture Most effective Diagnostic Tool.

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Treatment $\Rightarrow$

- ① NSAID $\Rightarrow$ for Pain & fever.
- ② Fluid & electrolyte replenishment (Diarrhea)
- ③ Broad spectrum Antibiotics are used $\rightarrow$ Like fluoroquinolone.
- ④ Practice Good Hygiene & Sanitation.
- ⑤ Prophylaxis = Live oral Vaccine.

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