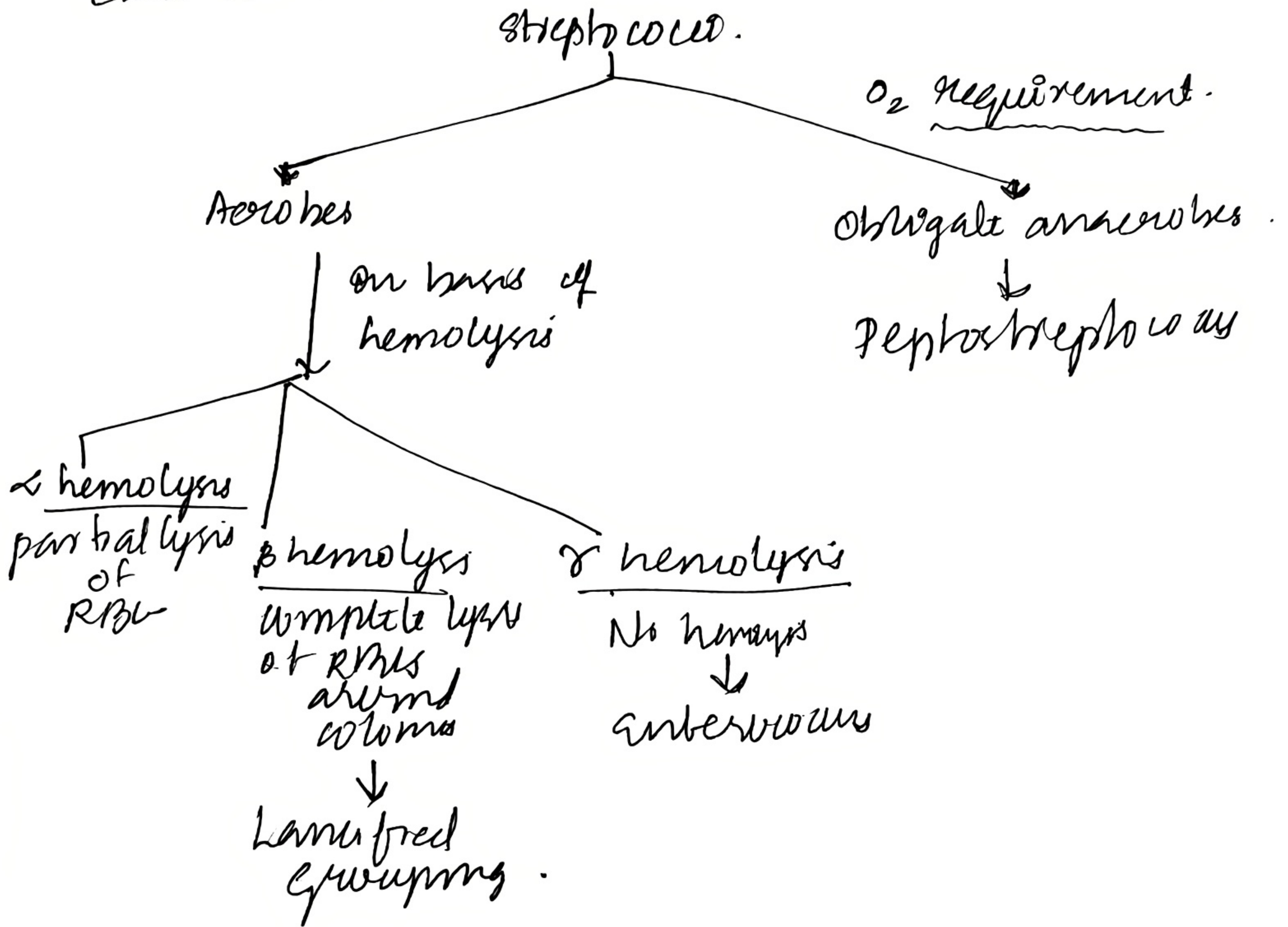


# STREPTOCOCCUS.

Gram +ve catalase negative cocci

Classification.



# Streptococcal Pyogene

↳ Group

## Virulence.

cell wall factors

- lipoteichoic acid.

↳ pharyngeal epithelial adhesion

- C-carbohydrate Ag.

- M-protein.

↳ inhibit complement mediated opsonization.

## Toxins.

① Hemolysins

↳ two types.

② streptolysin-S.

③ streptolysin-O.

produced by -

Grp A, C, G & H

streptococci

## Enzyme

① streptokinase (fibrinolysin)

↳ plasminogen to plasmin.

↓  
Fibrin break down

↓  
infection spread.

② streptodornase (DNase)

↳ breaks DNA

↳ liquefy tissue

(pus -> DNase

A, B, C & D

↓  
DNase B - most Ag

↓  
So Anti DNase for repeated diagnosis.

③ hyaluronidase

④ Esterase.

⑤ Phosphatase.

## streptolysin-O

oxygen labile.

Heat labile.

strongly antigenic.

↓  
Hence ASD. Abs. are produced  
helps in diagnosis

## streptolysin-S

oxygen stable.

serum soluble.

Not antigenic.

↓  
No help in diagnosis.

## ② Streptococcal pyogenic exotoxin

↳ SPE - Antic.

↳ SPE - Ag C.

↳ TSS

↳ scarlet fever

↳ Neurotoxic fasciitis.

# Streptococcal Pyogene

↳ Group

## Virulence

cell wall factors

- lipoteichoic acid.

↳ Pharyngeal epithelial adhesion

- C-carbohydrate Ag.

- M-protein.

↳ inhibit complement mediated opsonization.

## Toxins

① Hemolysins.

↳ two types.

② streptolysin-S.

③ streptolysin-O.

produced by -

Grp A, C, G & H

streptococci

## Enzyme

① streptokinase (fibrinolysin)

↳ plasminogen to plasmin.

↓  
Fibrin break down

↓  
Infection spread.

② streptodornase (DNase)

↳ breaks DNA

↳ liquefy tissue

(pus -> DNase

A, B, C & D

↓  
DNase B - Most Ag

↓  
So Anti DNase for repeated diagnosis.

③ Hyaluronidase

④ Esterase

⑤ Phosphatase

## streptolysin-O

oxygen labile.

Heat labile.

strongly antigenic.

↓  
Anti-ASO Abs. are produced  
helps in diagnosis

## streptolysin-S

oxygen stable.

serum soluble.

Not antigenic.

↓  
No help in diagnosis.

## ② Streptococcal pyogenic exotoxin

↳ SPE - Antic.

↳ SPE - Acy C.

↳ TSS

↳ scarlet fever

↳ Neurotoxic fasciitis.

# Infections / Clinical features

## - Suppurative Infections

PEN TIPS.

P - Pharyngitis.

E - Erysipelas

N - Necrotizing fasciitis

T - TSS.

I - Impetigo

P - Puerperal sepsis

S - Scarlet fever.

## Non Suppurative.

→ Acute Rheumatic fever.

→ Post streptococcal glomerulonephritis

→ Reactive arthritis

## Lab diagnosis

① Specimen collection: Based on lesion  
x wounds → Pus swabs exudates  
x. Bld

② Direct microscopy

— Gram & cell in chain.

③ Culture. S. pyogenes — fastidious organisms

↓  
grows on media enriched with bld,  
serum, carbohydrate.

② media used . blood agar.

③ crystal violet blood agar (selective media)

④ colony - few point colonies with wide zone of  $\beta$  hemolysis

⑤ Microscopy - Gram stain spherical cocci in chains.

⑥ motility testing : Hanging drop

⑦ Biochemical test.

a) Catalase test.  $\rightarrow$  +ve

b) Bacitracin sensitivity  $\rightarrow$  Group A streptococci is sensitive.

Others ~~are~~  $\beta$  hemolytic are resistant

⑧ Automated methods : VITEK & MALDI-TOF.

⑨ Lancefield grouping: Detecting 'C' carbohydrate with specific antisera and grouping

⑦ Serology  $\rightarrow$  ASO titre  $\rightarrow$   $> 200$  IU/ml diagnostic  
 $\rightarrow$  all infect<sup>n</sup> except impetigo & PSCA

$\rightarrow$  Anti DNAse B Ab

$\rightarrow$   $> 350$  IU/ml

$\rightarrow$  impetigo & PSCA.

⑥ AST.

\* Group A v/s Group B streptococci

| <i>S. pyogenes</i>   | <i>S. agalactiae</i> |
|----------------------|----------------------|
| Group A              | Group B.             |
| Bainbridge-sensitive | Resistant            |
| CAMP test -ve.       | +,                   |
| colony - pinpoint    | slightly larger.     |

\* Group B streptococci

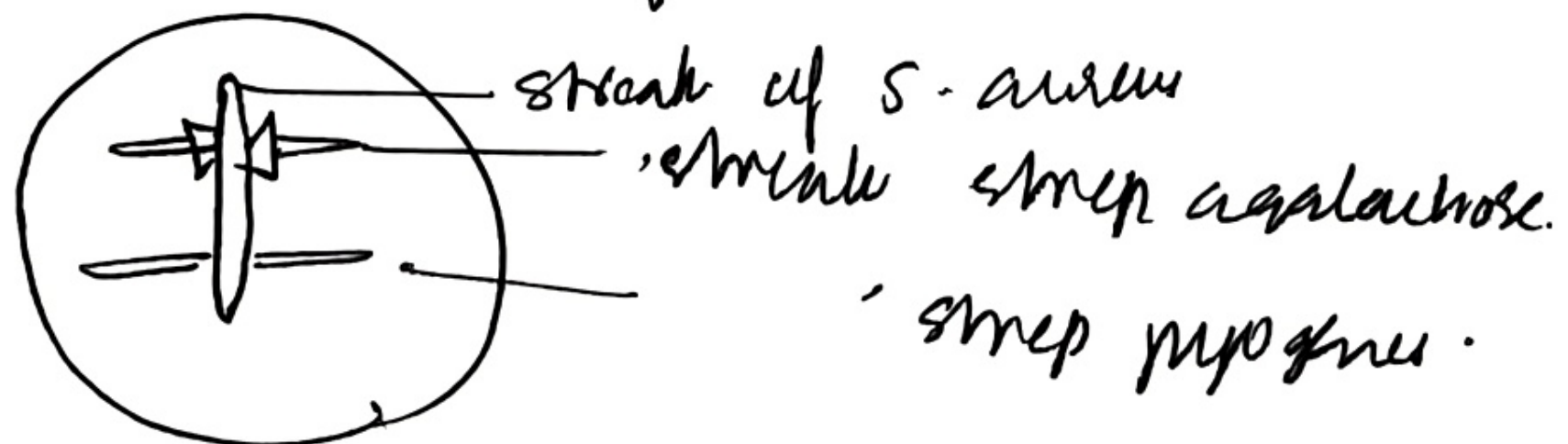
- ↳ Normal commensal of vagina.
- ↳ Cause m/o cause of neonatal meningitis, neonatal sepsis

Lab A.

① colony -  $\beta$  hemolytic & slightly larger.

② CAMP - Christie Allen Munn Peterson.

Based on CAMP factor. (phospholipase).



- ↳ After streaking, arrowhead shaped hemolysis is seen at junction toward S. aureus streak line.

③ Biochemical test: Baurhawn test - -ve

④ MALDI-TOF & VITEK.