Universidad Autónoma de San Luis Potosí

Facultad de Ciencias Químicas

Laboratorio de Microbiología

Streptococcus pyogenes

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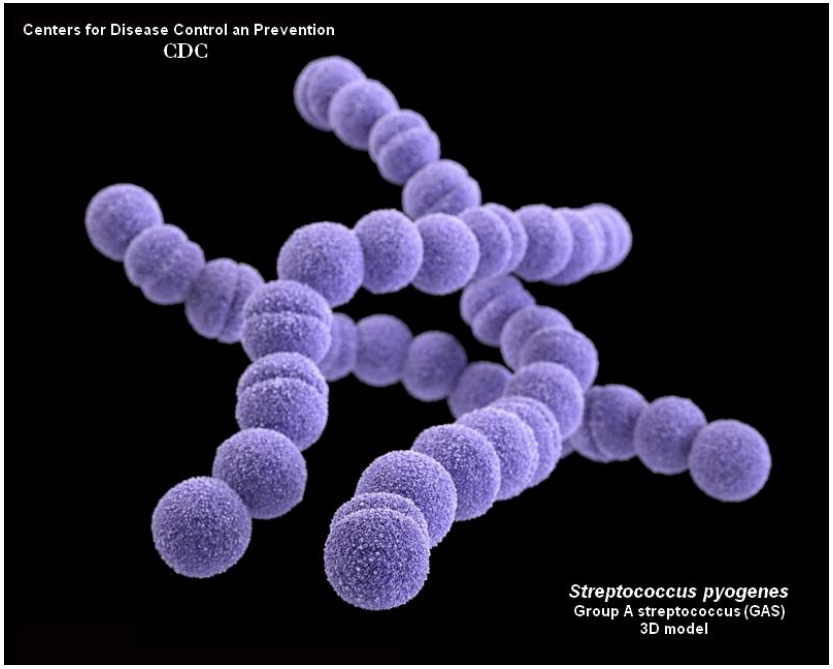
Group: 9:00 – 10:00

Streptococcus pyogenes

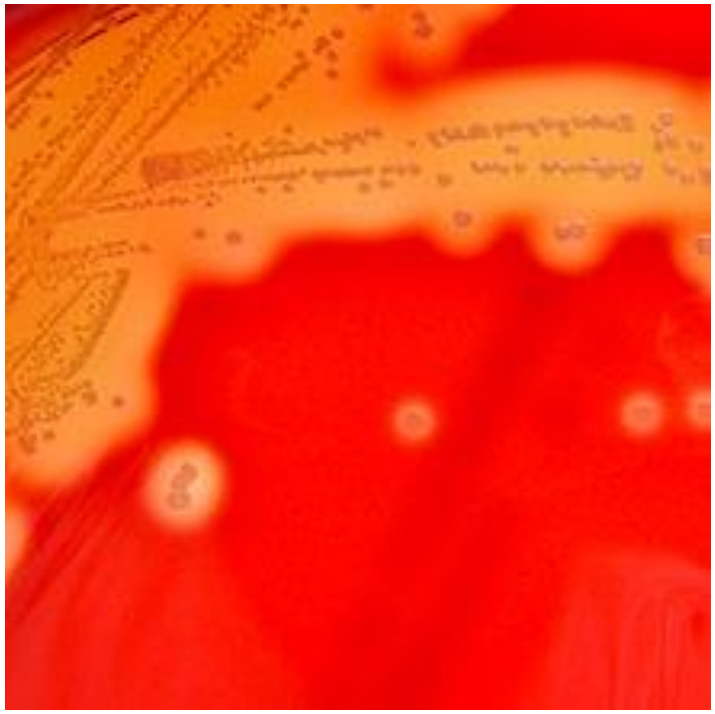


- **Objective:** To apply the acquired knowledge on biochemical tests and microbial susceptibility through the explanation of a clinical case.

- To know the mechanism of action of the antimicrobials described in this presentation.

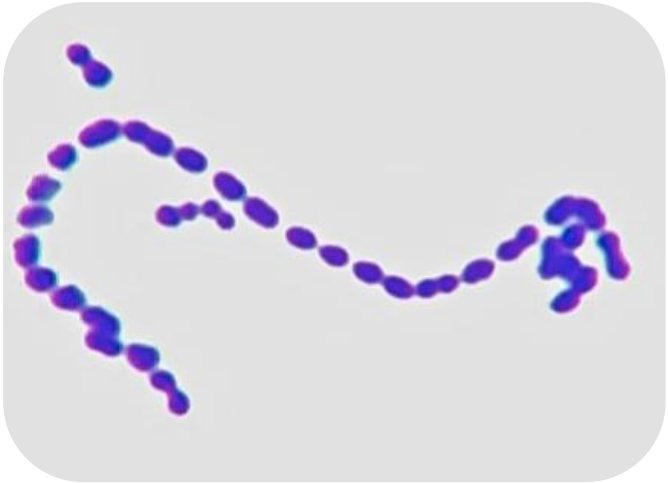
Introduction

- Known as β-hemolytic Streptococcus group A or group A streptococcus, it is a Gram-positive bacterium that grows in chains of four to ten cells. In its cell wall it expresses the group A antigen of the classification of Lancefield and does hemolysis of the β-hemolysis type when cultured in blood agar, due to the hemolysins it produces (streptolysin S and O).



Taxonomy

- **Domain:** Bacteria
- **Filo:** Firmicutes
- **Class:** Bacilli
- **Order:** Lactobacillales
- **Family:** Streptococcaceae
- **Genus:** Streptococcus
- **Species:** S. pyogenes
- (ROSENBACH, 1884)



Clinical manifestations

- Headache
- Sickness
- Vomiting
- Abdominal pain.
- Pharynx or tonsils with exudate.
- Petechiae on the palate.
- Anterior cervical lymphadenopathy

Clinical case

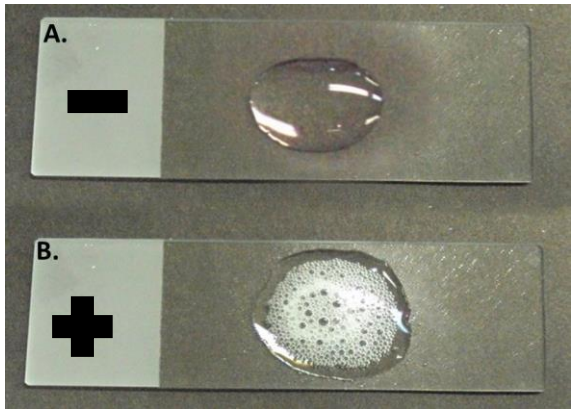
- A healthy 8-year-old patient started 6 days prior to admission with headache and fever, and a scarlatiniform rash appeared on the trunk and limbs. Consultation in 2 opportunities and is derived to his house with suspicion of viral etiology. At day 6, odynophagia, nonproductive cough and respiratory distress were added.
- The patient is noted, tachypneic, tachycardic, hypotensive and with limit oxygen saturation. Pulmonary examination describes a decrease in pulmonary murmur in the lower third of the left hemithorax and bilateral cramps. He entered the hospital with the following diagnoses: pneumonia with left pleural effusion and septic shock.

DIAGNOSIS

- In Gram staining of clinical specimens, short chains of Gram positive cocci are observed, whereas longer chains are observed from liquid culture media.
- In the catalase test it turns out to be catalase (-).
- The optimal growth is in blood agar. At 24 hours incubation at 37 ° C, white colonies of 1 - 2 mm are formed. With a marked area of β-hemolysis.

Streptococcus pyogenes

Staphylococcus aureus



- **Clinical samples:** Pharyngeal exudate, secretion of cutaneous lesions, tissues and sterile liquids.
- **Culture:** Samples are seeded in blood agar, and incubated for 18 to 24 hours. Colonies are punctiform β-hemolytic, catalase negative and their presumptive diagnosis is made by the susceptibility test to penicillin and ampicillin.

TREATMENT

- Penicillin remains the treatment of choice for streptococcal pharyngitis. Oral macrolides are used in allergic patients. Another alternative is the use of first-generation cephalosporins. Eradication of the agent requires a prolonged oral therapy of 10 days.

More commonly used antibiotics, doses and routes

Penicillins:

Benzathine penicillin: 1.2 to 2.4 million IU single dose i / m

Penicillin V: 500 mg c / 6-8 h v / o

Macrolides:

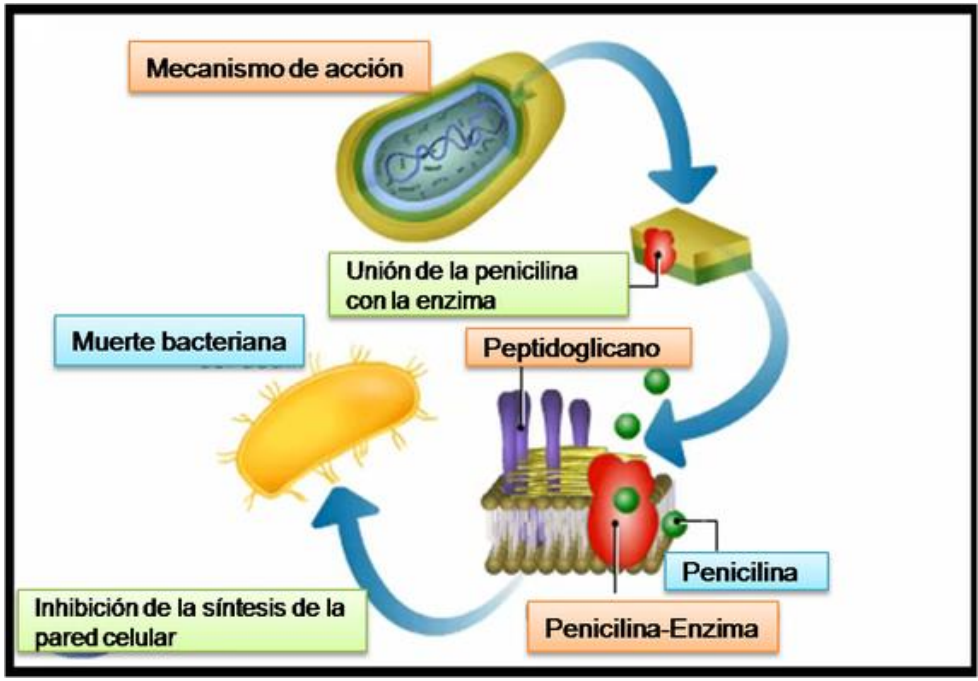
Clarithromycin 500 mg. Every 12 hours v / o

Azithromycin 1500 mg in 3 to 5 days v / o

Erythromycin 500 mg / dc / 12 hours v / o

Mechanism of action

- Inhibition of bacterial wall synthesis, which is essential for the life of the bacteria.
- Activation of endogenous autolytic systems.
- In order to exert their action, the beta-lactams have to bind to the penicillin binding proteins (PFP), blocking the synthesis of peptidoglycan, the main component of the bacterial wall.



Bibliography

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