UNIVERSIDAD AUTÓNOMA DE SAN LUIS POTOSÍ
FACULTAD DE CIENCIAS QUÍMICAS
Laboratorio de Microbiología
Klebsiella pneumoniae

Student: Rodrigo Velarde Salcedo

Teacher: Q.F.B. Juana Tovar Oviedo

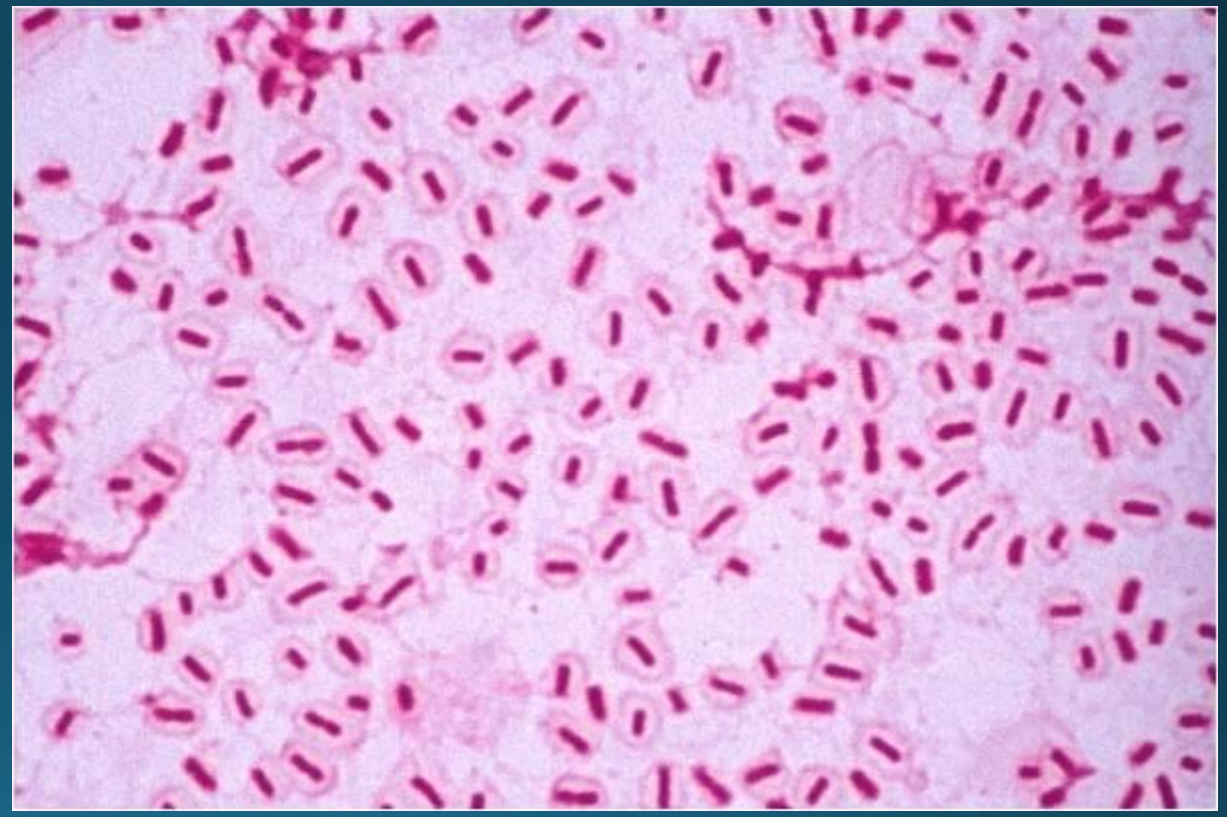
Gloria Alejandra Martínez Tovar

Group: 9:00 – 10:00

Klebsiella pneumoniae

- Gram (-) rod.
- Phylum: Proteobacteria
- Family: Enterobacteriaceae

- Causal agent of several pneumonia casaes, otitis, empyema, pericarditis, meningitis, sepsis and bronchitis.



Biochemical tests

Test	Result
Motility	-
Gelatin	-
Malonate	+
Urease	+ (Mild color change of medium)
Methyl Red	-
Voges-Proskauer	+
Indole	-
Ornithine	-

Antimicorbial susceptibility test

Antibiotic	Group	Diameter (mm)	Interpretation
Nalidixic acid 30 µg (NA 30)	Quinolones	20	Susceptible
Ampicilin 10 µg (AM 10)	Penicilins	6	Resistant
Ceftriaxone 30 µg (CRO 30)	Cephalosporins	33	Susceptible
Amikacin 30 µg (AN 30)	Aminoglycosides	22	Susceptible
Nitrofurantoin 300 µg (FM 100)	Nitrofuranes	16	Intermediate

Biochemical tests

Test	Result
Gram Stain	Gram (-) Rod
Oxidase	-
Lactose/Glucose	+/+
Gas	+
Hydrogen Sulfide	-
Simmons Citrate	+
Lysine decarboxylase	+
Phenylalanine deaminase	-

Clinical case: Neonatal sepsis by beta-lactamase CTX-M-15 producing *Klebsiella pneumoniae*

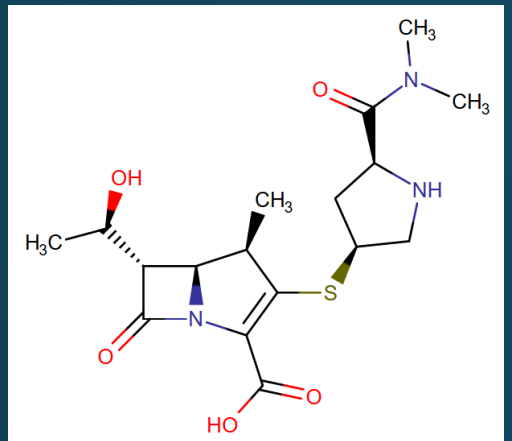
- Pacient: 12 days old male. Born at 7 months of gestation.
- Clinical Picture: Food rejection, hipoactivity, diarrhea and fever.
- Tests: Blood count, CSF (Cerebrospinal fluid) culture, Urine culture, Blood culture.
- **Empirical treatment: Vancomicin and Gentamicin.**

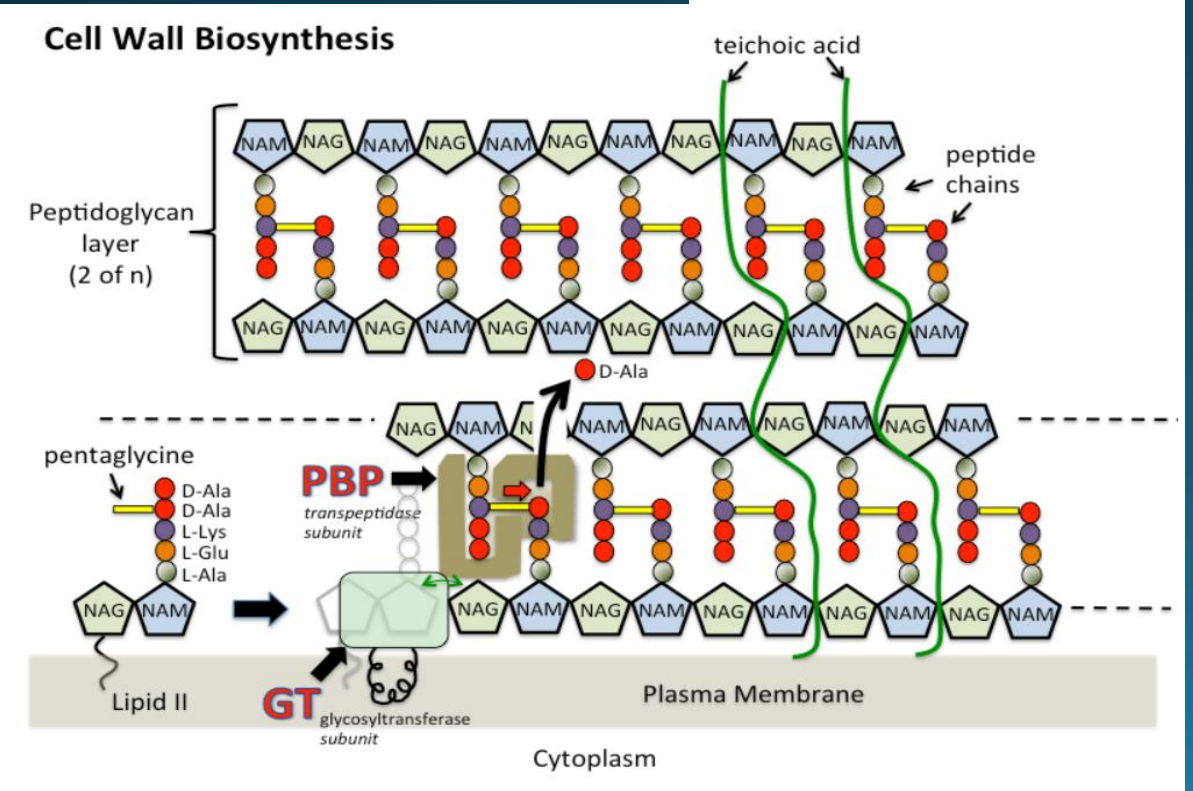
- 24 hours after empirical treatmente the patient´s condition aggravates, with apnea pauses.
- Results: Non-pathologycal CSF, *Klebsiella pneumoniae* found in blood culture. Leukopenia and thrombocytopenia.

- SUSCEPTIBILITY TEST RESULTS:
- RESISTANT TO: Ampicilin, Cephalosporins, Gentamicin and Tobracin.
- SUSCEPTIBLE TO: Fluoroquinolones, Amikacin y Carbapenemes.

- Treatment with Meropenem led to healing.

MEROPENEM MECHANISM OF ACTION





- Inhibition of cell wall synthesis.
- Meropenem penetrates the cell wall of most Gram-positive and Gram-negative bacteria to reach penicillin-binding-protein (PBP) targets.
- PBPs are involved in peptide translocation through the cell membrane during cell wall synthesis

Conclusions

- Biochemical test results led to *Klebsiella pneumoniae* identification.
- Antimicrobial susceptibility test results coincide with the clinical case results. (ampicilin resistance and amikacin and quinolone susceptibility).
- No synergisms or antagonisms were found among the studied antibiotics.

Bibliography

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