MYCOPLASMA

- Mycoplasma & Ureaplasma are the smallest free-living which lack the cell wall but bounded by a single-triple layer membrane that contain **sterols**.-
- Sterols are not synthesized by the organism. -
- Only three species are associated with human disease-
- ***Mycoplasma pneumoniae*** is a lower RT pathogen.-
- ***M. hominis & Ureaplasma urealyticum*** cause genitourinary tract infections.-

Mycoplasma pneumonia

- An aerobe , grow slowly in enriched liquid culture medium and on special *Mycoplasma* agar to produce minute colonies after several days` of incubation- giving the appearance of an inverted " fried egg"
- Colonies bind RBC's onto the surface of agar plate culture(hemadsorption)

Epidemiology of ***Mycolpasma pneumonia***

- accounts for about 10% of all pneumonia cases.
- infection acquired by droplet spread with a very low infection dose (less than 100 organisms)
- the most common age for *M. pneumonia* is between 5 and 15 years and less common in children less than 6 ms of age.
- incubation period is between 2 to 15 days.

Diagnosis of *M. pneumonia*

- Mononuclear cells usually appear in Gram-stained sputum.
- Because they lack the cell wall it is not seen under the microscope suggesting the etiology of the disease.
-The org. can be isolated from throat swabs or sputum of infected persons within a bout a week period of infection.
- Serologic tests rather than cultures are more commonly used for specific diagnosis. A 4 folds rise of serum ABs titer in a cute sera indicates *M.pneumonia* infection.

Treatment of *M. pneumonia*

- Erythromycin & tetracycline are the usual agents used for treatment of M. Pneumoniae lower respiratory tract infections.
- Azithromycin & Clarithromycin are comparable to erythromycin.
- Clindamycin is not effective
- Most quinolones are also active.

Legionella

- Another agent causing pnumonia in man. •
- It is Gram-negative bacilli •
- Stain poorly or not at all by Gram stain •
- It can be stained by Dieterle stain(silver impregnation methods. •
- Most species are motile with polar, subpolar and lateral flagella. •
- Spores are not found. •

Growth & Classification

- Fail to grow on common enriched bacterial media. That is related to unusual requirements for :L-cysteine, ferric ions & slightly acidic condition (pH 6.9)
- Growth is taken 2-5 days to produce colonies.
- Classification mainly depend upon some Enzymatic actions(catalase, oxidase, B-lactamase)& Nucleic Acid homology comparison
-Legionella has 14 serogroups & 30 species.

Diagnosis of *Legionella*

-Samples of lung aspirates, bronchoalveolar lavage, or biopsies are tested by direct fluorescent antibody (DFA) using *L. pneumophilia's* specific conjugates. It is + in only 25-50% of culture-proved cases.

- **Typically, the Gram smear show no bacteria.**
- **-** Buffered charcoal yeast extract (BCYE) agar meets the growth requirements of Legionella.

Contents of BCYE Agar Medium

-AA ‘s , Vitamins, L- cysteine, ferric pyrophosphate and charcoal to adsorb toxic fatty acids.

- Growth appears after 2-5 days when stained by usual Gram Stain looks as

Large-Gram negative rods

Diagnosis is confirmed by DFA staining of

Bacterial smears.

Diagnosis can also be established by PCR or

Detection of antigen by immunoassay of urine.

Prevention

- Prevention only done by avoiding aerosols from contaminated water.
- Methods` of decontamination of water
- Systems are` under evaluation as
- *Legionella is relatively resistant to chlorine*
- *and heat.* or by temporarily elevating the system temp. above 70 C

TREATMENT

- Erythromycin is the best effective antibiotic for treatment of legionella.

-Erythromycin is more effective than Penicillin, or cephalosporins or aminoglycosides. *In vitro* susceptibility test confirmed the activity of tetracycline, refampin and the newer quinolones too.

QUIZ

Mention the Causative Agent of the following Diseases and how you can diagnose with fast Method (s) in the laboratory.

1- Syphilis

2- Plague

3- Leptospirosis

Note:

Mention the type of sample that you will use.

QUIZ

How you cure & prevent the spreading of the following diseases:

1- Leptosirosis

a- treatment:

b- prevention

2- Lyme disease

a- traetment

B- prevention

3- Meningitis caused by *H. influanzae*

A- treatment

b- prevention