

MVSc Programme VMC-602

Lecture - 11

Trueperella pyogenes

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General Characteristics

- *Trueperella pyogenes*: A pleomorphic, Gram positive, non-motile, non-spore forming, non-capsulated facultative anaerobe
- Catalase negative - shows fermentative metabolism
- Also exhibit strong proteolytic activity
- Previously, the organism was known as *Corynebacterium pyogens* - causing “*Summer mastitis*” in cattle

Classification:

- *Species: Trueperella pyogenes*
- *Family: Actinomycetaceae*
- *Order: Actinomycetales*
- *Class: Actinobacteria*

General Characteristics

- The organism has seen several names change
- Renamed as *Actinomyces pyogenes* and again as *Arcanobacterium pyogenes*
- Required media enriched with blood or serum for culture
- On blood agar, the colonies are surrounded by zone of beta-haemolysis

Epidemiology:

- Part of normal microflora of skin and upper respiratory, genital and gastro-intestinal tracts of animals
- Considered as an important opportunistic pathogen
- Worldwide occurrence causing purulent, suppurative infections on domestic and wild animals
- Adverse climatic condition and host related factors play important role in disease establishment
- *Trueperella pyogenes* is implicated in **polymicrobial infections**

Virulence factors:

- The virulence factors of *T. pyogenes* are:
 - **pyolysin (a toxin)**
 - adhesion molecules (fimbriae, neuraminidases)
 - extracellular matrix-binding proteins
 - extracellular enzymes
(serine proteases, gelatinase, caseinase, DNase etc)

Pyolysin (PLO) :

- Main virulence factor
- An exotoxin - belongs to the cholesterol-dependent cytolysins
- Displays a cytotoxic effect on a variety of host cells
- Affects: Erythrocytes, polymorphonuclear neutrophils (PMNs), macrophages, epithelial cells, fibroblasts, Endometrial stromal cells etc
- Forms trans-membrane pores

Synergistic association:

- It is frequently isolated from mixed infections with
 - *Fusobacterium necrophorum*,
 - *Bacteroides* spp.,
 - *Peptostreptococcus indolicus* etc.
- Causing clinical conditions such as mastitis, uterine infections, liver abscess, foot rot etc.
- Synergistic association have been shown between these organisms

Synergistic association:

- *T. pyogens* decreases the *oxidation-reduction potential* which promotes the growth of *F. necrophorum*
- Leukotoxin produced by *F. necrophorum* protects *T. pyogenes* from phagocytosis
- Lactic acid produced by *T. pyogenes*, can be used by *F. necrophorum* as an energy substrate

Clinical conditions:

- *In cattle*: mastitis, metritis, endometritis, pneumonia, pyelonephritis and liver abscesses
- Uterine infections usually follow parturition
- Mastitis is caused in both lactating as well as dry cows

Clinical conditions:

- *In swine:* Pneumonia, mastitis, pleuritis, endocarditis, arthritis, reproductive tract infections, and septicaemia
- *In small ruminants:* foot rot and abscesses
- *In horses:* metritis, mastitis, septicaemia, orchitis, umbilical infection in foals, wound infection etc

THE END

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