

# *Bordetella*

NATURAL REMEDIES FOR  
**WHOOPING  
COUGH**

*Getting Through it IS Possible*



- The genus *Bordetella* contains seven species. *B. pertussis* is by far the most important causative agent of whooping cough
- Properties:
- *B. pertussis* is a tiny (0.5 to 1.0  $\mu$ m), gram-negative coccobacillary rod.

- Encapsulated
- Obligate aerobe
- The organism is also very susceptible to environmental changes and survives for little time outside the human respiratory tract.
- Oxidase and Catalase positive.
- The pilli of cell contain a protein called **filamentous haemagglutinin** (fha)

- **Epidemiology:**
- B. pertussis is **spread by droplets** produced by patients in the early stages of illness.
- It is **highly contagious**, infecting 80 to 100% of exposed susceptible persons.
- **Pathogenesis:**
- B. pertussis is a strict **human pathogen**
- Primarily a disease of infants and children



The organism attaches to the respiratory mucosa with the help of filamentous haemagglutinin (fha).

- The bacteria immobilize the cilia and begin a sequence in which the ciliated cells are progressively destroyed.



- In addition to filamentous haemagglutinin it produces different virulence factors:
  1. **Pertussis toxin** (Exotoxin) is a single antigen causing local tissue damage associated with inflammation. It activates adenylate cyclase. This results in production of cAMP. It causes promotion of **lymphocytosis** and inhibition of phagocytosis.
  2. **Tracheal cytotoxin**: damages ciliated cells of the respiratory tract.

## ■ Clinical Findings:

- Whooping cough is an acute tracheobronchitis that begins with mild upper respiratory tract symptoms followed by a severe paroxysmal cough, which lasts from 1 to 4 weeks.



- Occurs in three distinct stages:
- Catarrhal stage: mild upper respiratory tract infection
- Paroxysmal stage: extends to the lower respiratory tract, with severe cough
- Convalescent stage: may persist for several months

- **Lab diagnosis:**
- Gram staining.
- Nasopharyngeal swabs taken during the paroxysmal stage. **Bordet-Gengou medium** is used for the culture (Split pearls or **mercury drops colonies**)
- Cough plate Technique
- Direct fluorescent-antibody staining of the nasopharyngeal specimens



- Polymerase Chain Reaction (PCR).
- **Treatment:**
- Erythromycin reduces the number of organisms in the throat and decreases the risk of secondary complications
- **Prevention:**
- By vaccination (DPT vaccine)



■ **Q: Cough plate technique is used for isolation of which organism?**

- A) *Salmonella typhimurium*
- B) *Bordetella pertussis*
- C) *E. coli*
- D) *Yersinia pestis*
- E) *Pseudomonas aeruginosa*

**Q: A nasopharyngeal swab grown on agar medium produced a characteristic colonies, which organism do you have?**

- A) *Salmonella typhimurium*
- B) *Bordetella pertussis*
- C) *E. coli*
- D) *Yersinia pestis*
- E) *Pseudomonas aeruginosa*

