

# PLAGUES IN MAN

## 200 YEARS OF CHOLERA

### I. HISTORY

- A EPIDEMIC IN ASIA SINCE THE 18<sup>TH</sup> CENTURY
  - 1. SEVERAL PANDEMICS "OUT OF ASIA", FIRST IN 1817
  - 2. UNTREATED WATER (FOOD)
  - 3. JOHN SNOW AND THE LONDON EPIDEMIC - 1832, 1849
  - 4. INDIA/ENGLAND
    - a. EPIDEMICS GREW WORSE IN INDIA/ASIA
    - b. EPIDEMIS BECAME MILDER IN ENGLAND/WESTERN EUROPE AND NORTH AMERICA
  - 5. REFERRED TO AS "DISEASE OF CIVILIZATION"
    - a. WAS ENDEMIC IN INDIA/ASIA FOR CENTURIES
    - b. BECAME EPIDEMIC AND THEN PANDEMIC AFTER 1800 WHEN POPULATION REACHED A "THRESHOLD"
    - c. LIFE EXPECTANCY IN INDIA IN 1820 WAS ABOUT 20 YEARS - ACTUALLY DECLINED BY 1880.
    - d. A DISEASE OF THE POOR
  - 6. IN 1884 KOCH ISOLATED THE "COMMA BACILLUS"
    - a. THE GERM THEORY OF DISEASE
    - b. JOHN SNOW'S WRITINGS BELIEVED
    - c. DRINKING WATER THE MAIN PROBLEM
  - 7. RECENT EPIDEMIC IN PERU - 1991 - PART OF THE "SEVENTH PANDEMIC"
- B. THE AGENT - *VIBRIO CHOLERA*
  - 1. GRAM NEGATIVE,  $\gamma$ -PROTEOBACTERIUM
  - 2. PROPERTIES LIKE *E. COLI*
    - a. GROWS RAPIDLY
    - b. FACULTATIVE, CHEMOHETEROTROPH
    - c. PRODUCES A POWERFUL TOXIN
    - d. MOTILE WITH POLAR FLAGELLUM
  - 3. MANY STRAINS - *V. cholera* O:1 (*EL TOR*)
- C. PATHOGENESIS
  - 1. COLONIZES SMALL INTESTINE (NEED HIGH DOSE)
  - 2. PRODUCES POWERFUL ENTEROTOXIN - THE CHOLERA TOXIN
  - 3. TOXIN AFFECTS THE LARGE INTESTINE
    - a. TOXIN BINDS TO EPITHELIAL CELLS OF COLON
    - b. A BIPARTITE TOXIN
    - c. MODE OF ACTION IS KNOWN
  - 4. CAUSES SEVERE DIARRHEA (CRAMPS AND VOMITING)
    - a. "RICE WATER" STOOLS
    - b. RAPID DEHYDRATION - BLUE, WRINKLY SKIN
    - c. PAINFUL CRAMPS
    - d. CARDIAC ARREST
- D. PREVENTION AND TREATMENT
  - 1. ANTIBIOTICS WORK BUT ARE OF LITTLE USE
    - a. TETRACYCLINES ARE PRFERRED
    - b. USUALLY TOO LATE FOR CHEMOTHERAPY
  - 2. ELECTROLITES AND WATER ARE TREATMENT
    - a. ORALLY AND IV IF NEEDED
    - b. CDC RECOMMENDS SPECIAL TREATMENT
  - 3. SAFE DRINKING WATER
  - 4. INSPECTION OF SHELLFISH AND MONTORING HARVEST AREAS