

Plague: The Living Bomb

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PLAGUE, 'The Living Bomb' has been exploding periodically in the world and particularly in India killing millions and millions. In view of the current explosion at Surat, Gujarat, it is mandatory on the part of our Nursing profession to communicate about this terrible disease for public and professional awareness and protection.

Global Epidemic: WHO Reports

- Half of Europe's people were wiped out due to Plague in the past.
- During 15 years from 1978 to 1992, 14,806 cases were reported including 1,452 deaths.
- In 1992, a total of 1,768 cases were reported including 198 deaths in India.
- First recorded outbreak of Plague occurred in 1612 at Agra.
- From 1898 to 1908, 5,48,427 died due to Plague. Since then it is occurring periodically.
- No laboratory confirmed human Plague has been observed since 1966. However, there were suspected two outbreaks in Himachal Pradesh and border zone of Tamil Nadu and Andhra Pradesh.

Current Epidemic

In September 1994, it occurred at

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Surat, the Silk City of India, flaring Maharashtra, Punjab, West Bengal, Rajasthan, Delhi, Orissa because of migration of labour.

Till Date (October 1994): Surat (685 cases were reported excluding 57 deaths: the real figure is likely to be increased); Gujarat state including Surat - 871; West Bengal - 22; Delhi - 121 cases including 2 deaths; Punjab - 16 cases; Maharashtra - 483; Madhya Pradesh - 2; Uttar Pradesh - 5; Rajasthan - 44.

Medical Staff to fall prey: Seven doctors and two nurses contracted the disease while doing service to the society.

Reasons behind recurrence: Plague disappears completely and is reintroduced from other areas by infected rodents, flea; Plague bacilli survive and multiply in the soil of rodent burrows for prolonged periods; the real factors for current epidemic are still to be identified.

Aetiopathogenesis

Agent: *Y. pestis* a gram negative, non-motile coccobacillus.

Reservoir: Wild rodent, i.e., field mice, Gerbil has been incriminated, not domestic rat, *Rattus rattus* once thought.

Source of infection: Infected rodent, fleas and cases of Pneumonic Plague.

Host factor: It is a zoonotic disease and man contracts the dis-

ease by chance. Fleas ingest upto 0.5 cumm blood containing bacilli, the bacilli multiply and block the gut (Block flea) thus the flea can not take blood and makes an effort to take blood and inoculate bacilli into human beings. It is a primary disease of rodents in which man becomes accidentally involved by: (i) bite of infected fleas; (ii) by direct contact with the tissue of the infected animal; (iii) Droplet infection in case of Pneumonic Plague.

Infection Cycle

- (i) Commensal rats — rate fleas — man basic cycle in the epidemic of Bubonic Plague.
- (ii) Wild rodent — wild rodent fleas — man.
- (iii) Man — man, seen in Pneumonic Plague and infection is contracted through respiratory route.

Disease in Man:

Clinical Feature

There are three main clinical presentations:

(a) Bubonic Plague — most common type of the disease. Feature — Sudden fever, chill, painful lymphgland enlargement (bubos) develop in the groin, axilla neck.

It can not spread from person to person.

(b) Pneumonic Plague — Highly infectious, blood born infection producing pneumonitis/pneumonia; spread from man to man by droplet — infection.

(c) Septicaemic Plague — rare but can occur following Bubonic infection.

Laboratory Investigations

(a) Isolation and identification of plague bacillus by : staining the material, i.e., bubo fluid by aspiration cytology; sputum stained with giemsa stain in Pneumonic Plague.

(b) Culture : Blood culture from patient, bubo fluid sputum, ensures steady isolation of bacilli.

(c) Serology : Antibody of serum taken from patient.

(d) Inoculation of guinea pig or mice.

Nursing Care and Control Measures

(1) Early Diagnosis :

- Self consciousness / awareness.
- During epidemic period like the present situation — (i) any patients coming from Surat with (ii) fever, painful lymphadenitis should be subjected to thorough clinical examination and investigation unless otherwise disproved.
- History of dead rat fall to be notified by international health regulation.
- All patients are to be kept under Barrier Nursing. Pneumonic Plague needs more isolation as compared to others.
- Sputum, discharge and articles soiled by the patient should be properly disinfected.
- Nurses, doctors, laboratory workers should use mask and gown while handling Pneumonic Plague infected people.
- Health education :
Essential part of Plague con-

trol programme providing the public correct information especially railway station, airport about Plague and enlisting their cooperation.

- Individuals working in high risk occupation in Plague endemic area should be considered for vaccination.
- Individuals briefly visiting Plague endemic area should take Tetracycline.
- Contact of patients should take Tetracycline 250mg 6 hrly and advised to take attention if fever and respiratory symptoms develop.

Vaccination : Immunization with Plague vaccine is a valuable preventive measure.

WHO recommends two doses to be given subcutaneously at the dosages of 0.5 and 1 ml at an interval of 7 to 14 days. Single dose will not result in dependable protection. However, in emergency as seen in the present situation at Surat it is desired to carry out primary immunization by means of single injections. In that case the dose should be doubled, i.e., 3ml for adults. Immunity starts 5 to 7 days after inoculation and lasts for six months.

To be given to high risk people such as doctors, nurses, laboratory workers and public exposed to the disease.

Treatment : Unless promptly treated Plague may have 50% mortality. Pneumonic Plague : 100% mortality.

Drug of Choice : Streptomycine 30mg/kg in two divided doses; Tetracycline 30-40 mg/kg x 10 days.

Culture sensitivity of other modern drugs Quinolone and Cephalosporins are awaited.

Prevention

Control of rat fleas to break chain of transmission rodent-fleaman.

1. In general, DDT and BHC should be used as dust containing 10% and 3% of active ingredient. The inhabitant of the premises should be asked to remove all foodstuff, eating and cooking utensil from the house.

2. Control of rodents - mass destruction of rodent; emphasis on prompt reporting of dead rat (rat fall).

3. Surveillance : In any focus of Plague, surveillance of human cases, vertebrates reservoir and vector should be undertaken on a permanent basis and should be features of health programme.

4. Quarantine - Modern system of land and sea. Quarantine extends upto 10 days.

5. Eradication of rodent in the ship requires special measures, cyanogas fumigation and the same also pumped into rat burrows.

6. International travel should be restricted or stopped as far as possible.

References

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