Communicable Diseases

MALARIA

INTRODUCTION

- Antrophod borne
- Protozoal disease
- Transmitted to man by certain species of infected Female Anopheline mosquito.

PROBLEM STATEMENT

- 109 countries in the world are endemic
- India – Major public health threat
- Most affected states are NE states
- Forest related – causing 30% of cases
- Tribal Malaria – contributing about 50% of P.F. cases
- Rural Malaria
- Urban Malaria
- In project area
- Border Malaria - population mixing & poor administrative control.

AGENT FACTORS

	India
Agents –	
Plasmodium vivax	70%
Plasmodium falciparum	25-30%
Plasmodium malariae	< 1%
Plasmodium ovale	Rare

Plasmodium vivax - the widest geographic distribution throughout the world.

LIFE CYCLE

RESERVOIR OF INFECTION

- Any person, animal, anthropod, plants, soil or substance (or combination) in which an infectious agent lives & multiplies, on which it depends primarily for survival and where it reproduces itself in manner that it can be transmitted to a susceptible host.
- Only man, possible exception of chimpanzees and no other.
- Children are more likely carriers than adults.

Reservoir criteria

1. Person must harbor Both sexes of gametes.
2. Gametes must be Mature.
3. Gametes must be Viable.
4. Gametes must be in sufficient Density
   (at least 12/mm3).

PERIOD OF COMMUNICABILITY

- As long as mature, viable gametocytes exits in circulating blood in sufficient density.
- Gametocytes are most numerous during the early stages of the infection.

HOST FACTORS

- Age – All (newborn have considerable resistance to P.F.)
- Sex – Males + (out door life).
- Race – AS Hb (sickle cell trait) milder illness.
- Pregnancy – ↑ risk of malaria, primigravid are at greatest risk.
- Socio-ecomonic - + relationship.
- Housing – ill ventilated, ill lighted houses provide ideal indoor resting places.
- Population mobility – may import malaria parasites.

HOST FACTORS

- Occupation – predominantly a rural disease and closely related to agriculture practice.
- Human habits – sleeping out-doors, nomadism , refusal to accept spraying, not using measures of personal protection, etc
- Immunity – acquired only after repeated exposure over several years.

ENVIRONMENTAL FACTORS

- Season – seasonal disease, max prevalence is from July to Nov.
- Temp. – affects life cycle of parasite.

  20 deg. To 30 deg. optimum for development of parasite in vector.
- Humidity – direct effect on length of life of mosquito.

  R. humidity 60% is necessary.
- Rainfall – provides opportunities for breeding but heavy rain may flush out the breeding places.

ENVIRONMENTAL FACTORS

- Altitude – Anophelines are not found at altitude above 2000-2500 m.
- Man-made malaria – burrow pits, pools, irrigation channels, etc have led to breeding of vector.

MODE OF TRANSMISSION

A. Vector transmission – by bite
B. Direct transmission – IV & IM inj. of blood or plasma, B.T., malaria in drug addicts. (since parasites keep their infective activity at least 14 days in blood bottles stored at – 4 deg. C, person living in endemic area or had malaria should not be accepted as blood donor until 3 years afterwards).
C. Congenital malaria – from an infected mother but rare.

INCUBATION PERIOD

From Bite ⟶ to Fever

Usually not less than 10 days.

- Plasmodium falciparum = 12 (9-14) d
- Plasmodium vivax = 14 (8-17) d
- Plasmodium ovale = 17 (16-18) d
- Plasmodium malariae = 28 (18-40) d

(for P.V. may be delayed for 9 months)

CLINICAL FEATURES

- Primary fever correspond to development of parasites in RBCs.
- The peaks coincide with the release of merozites inti blood stream.

Three stages –

1. Cold Stage
2. Hot Stage
3. Sweating Stage

Cold

- Onset with lassitude, headache, nausea, chilly sensation & rigors.
- Temp. rises rapidly to 39-41 deg. C
- Headache is often severe
- Vomiting is common
- Early skin feels cold, later hot
- Pulse rapid & weak
- Last for ¼ - 1 hr.

Hot

- Burning hot and casts off his clothes
- Skin is hit & dry
- Headache is intense but nausea commonly diminishes
- Pulse full, respiration rapid
- Lasts for 2-6 hrs

Sweating

- Fever comes down with profuse sweating
- Temp drops rapidly to normal
- Skin cool & moist
- Pulse slower
- Pt feels relieved & falls asleep
- Lasts for 2-4 hrs

CLINICAL FEATURES

- Febrile paroxysms occurs with definite intermittent periodicity repeating every third or fourth day depending upon species of parasite involved.
- Have tendency to relapse & characterized by splenomegaly & sec. anemia
- Febrile herpes is common.
- P.f. – prim fever in first few days is usually irregular or continuous.
- P.v.- usually milder and more regular.
- P.o.- more milder & cease after few days even without Rx.
- P.m. – same as P.v. but cycle is of 72 hrs instead of 48 hrs.

COMPLICATIONS

- P. F. – cerebral malaria, acute renal failure, liver damage, GIT symptoms, dehydration, collapse, anemia, etc.
- Other – anemia, splenomegaly, hepatomegaly, herpes, renal complications, etc.

DIAGNOSIS

- Depends on demonstration of parasites in blood.
- Suspicion by epi. & clinical evidence.