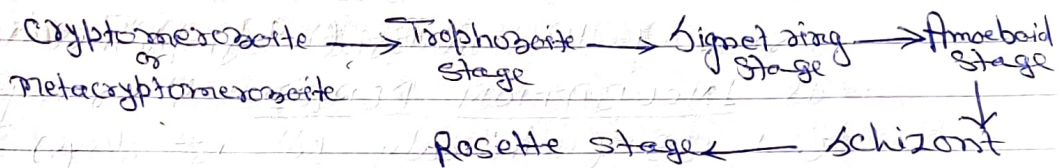


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periphery, get surrounded by the bits of cytoplasm and form the ERYTHROCYTIC MEROZOITES or SCHIZOITES. The haemozoin granules accumulate in the centre.

The whole structure is arranged like the petals of a rose flower or a cluster of grapes. Thus, the stage is known as the ROSETTE STAGE.



③ After some time, the cell membrane of the totally exhausted corpuscle bursts liberating the merozoites & toxic wastes in the blood plasma.

④ The merozoites attack the fresh R.B.C and repeat the erythrocytic schizogony. One erythrocytic cycle in the man, also known as the Cycle of Golgi is completed within 48-72 hours, according to the species of *Plasmodium*. [In *P. vivax*, *P. ovale* & *P. falciparum* it is 48 hrs, whereas in *P. malariae* it is 72 hrs.]

Destruction of R.B.C. eventually causes patient to become anaemic. After 5 successive erythrocytic cycles the malarial symptoms develop for the first time and the host suffers from malarial fever, which are now repeated at the end of each schizogony (i.e. every 48-72 hrs) with the release of fresh batches of merozoites & haemozoin in blood.

5 INCUBATION PERIOD : & PRE-PATENT

The duration between the sporozoite infection and the first appearance of the parasite in the blood is termed as the PRE-PATENT PERIOD. It ranges from 6 to 9 days according to the species.

The interval between the mosquito-bite or introduction of sporozoites into the human blood and the first appearance of the malarial symptoms is known as INCUBATION PERIOD. It ranges from 6 to 35 (commonly 10-15 days) days % to the various species.

6 FORMATION OF GAMETOCYTES :-

(a) As a result of repeated schizogony in the blood-stream, the parasite becomes so plentiful that its existence is threatened due to lack of fresh R.B.Cs and the resistance of the host. Consequently, the parasite prepares itself to enter the new host by the formation of gametocytes.

(b) Some of the merozoites, after entering the R.B.Cs, do not form trophozoites but grow slowly and become compact bodies, the gametocytes. These are of two types —

i) The more numerous, but small in size and with a large centrally placed nucleus are the MICROGAMETOCYTES, Potentially male.

ii) The less numerous but larger in size and with a greater amount of dense cytoplasm and a small nucleus are the MACRO or MEG GAMETOCYTES Potentially female.

The mature gametocytes are unable to develop further in the body of primary host and can survive at the most for a week. They reach the superficial blood vessels and wait for the bite of female Anopheles.

[B] EXOGENOUS or SEXUAL LIFE CYCLE IN ANOPHELES

When Anopheles sucks the blood of a diseased man, the parasite under different stages of development enters its alimentary canal.

But, only the gametocytes are able to survive, while others are digested. The gametocytes are set free by the rupture of R.B.C. and develop further to form gametes.

1. DEVELOPMENT OF MACROGAMETES :-

(a) The nucleus of microgametocyte divides repeatedly to form 6 to 8 haploid nuclei, as 1st division is a reductional one.

(b) Each nucleus is surrounded by a little of cytoplasm and metamorphoses into a male gamete. Each has a small body with nucleus and a cytoplasmic flagellum.

(c) The formation of the microgametes is so sudden and violent or explosive that this process is called as EXFLAGELLATION.

(d) By the lashing movements of their flagella the male gamete swims in the stomach fluid.

2. DEVELOPMENT OF FEMALE GAMETE (MACROGAMETES) :-

The nucleus of the meg gametocyte undergoes a reduction division forming two nuclei. One of them protrudes out as a polar body and the other comes to lie in the protuberance which is known as RECEPTION CONE. Thus the microgamete is formed.

3. FERTILIZATION :-

(a) The actively moving male gamete is attracted by the female gamete (macro gamete) and penetrates it through the reception cone.

(b) The nuclei of the two fuse together forming the SYNGARYON or ZYGOTE. It is inert and rounded.

(c) Soon, the zygote elongates, assumes the vermiform appearance and becomes motile. It is now known as VERMICULE or OOKINETE. By its tapered anterior end, it pierces the gut wall and comes to lie in the sub-epithelial tissue underneath the outer limiting membrane. Now it begins to encyst.

(d) It becomes rounded, secretes a thin membranous cyst and is known as OOCYST or SPORONT. It feeds by absorption and increases in size.

4. SPOROGENY :-

(a) The diploid oocyst enters upon a phase of asexual multiplication known

5 SPOROLOGY

(B) Its nucleus divides first by meiosis and then by repeated mitosis (Bano, 1989), forming an enormous number of haploid daughter nuclei. These get surrounded by fragments of cytoplasm. In this way, about 10,000 minute, slender and sickle-shaped bodies, called Sporozoites, are formed from each oocyst.

(C) [In malaria Parasite, a SPOROBLAST STAGE is absent and the sporozoites are thus formed directly from the oocysts.]

(D) The sporozoites are liberated in the haemocoel or body cavity by the rupture of the cyst wall. These now move to different body organs and also enter the salivary gland.

With the entrance of Parasite in the salivary gland, the female Anopheles becomes infective and is able to inoculate the sporozoites into the blood-stream of healthy person.

Illustrate the Pathogenicity & Control of Malaria?

Ans:-

The word "Malaria" is derived from two Italian words, Mala (bad) and aria (air) meaning "bad air". In the past, as far back as 1753, the disease was believed to be caused by the poisonous damp air but Charles Laveran & Ronald Ross in the later half of the 19th century had convinced the people that it is due to Plasmodium not by bad air.

PATHOGENICITY :-

A EFFECT ON MOSQUITO :-

The parasite is non-pathogenic, that is, has no harmful effect on the mosquito.

B EFFECT ON MAN :-

In man infection with Plasmodium causes malaria fever. The first symptoms appear by the end of the incubation period about two weeks after the infection.

The malaria fever is classified into following headings caused by different species of Plasmodium:-

1) Benign tertian or vivax :-

① It is caused by P. vivax

② Fever recurs after every 48 hours.

③ Death rate is low.

2) Malignant tertian :-

① It is due to P. falciparum.

② It is also known as AESTIVO-AUTUMNAL or the tropical one.