Lab-1

Medical parasitology: deals with the parasites, which cause human infections and the diseases they produce. It is broadly divided into 2 parts: Protozoology and Helminthology.

Parasites

Parasites are living organisms, which depend on a living host for their nourishment and survival. They multiply or undergo development in the host. The term 'parasite' is usually applied to Protozoa (unicellular organisms) and Helminths (multicellular organisms).

Parasites can also be classified as:

Ectoparasite:

Ectoparasites inhabit only the body surface of the host without penetrating the tissue. Lice, ticks, and mites are examples of ectoparasites. The term infestation is often employed for parasitization with ectoparasites.

Endoparasite:

A parasite, which lives within the body of the host and is said to cause an infection is called an endoparasite. Most of the protozoan and helminthic parasites causing human disease are endoparasites.

Free-living parasite:

It refers to non-parasitic stages of active existence, which live independent of the host, e.g. cystic stage of Naegleria floweri.

Types of parasitic host

Host

Host is defined as an organism, which harbors the parasite and provides nourishment and shelter to latter and is relatively larger than the parasite.

- **Definitive host**
- **Intermediate host**
- **Paratenic host**
- **Reservoir host**
- **Accidental host**

Laboratory Diagnosis

Most of the parasitic infection cannot be conclusively diagnosed. On the basis of clinical features and physical examination laboratory diagnosis depends upon:

- Microscopy
- Culture
- Serological test
- Skin test
- Molecular method

- Animal inoculation
- Xenodiagnosis
- Imaging
- Hematology.

Microscopy

An appropriate clinical specimen should be collected for

defi nitive diagnosis of parasitic infection .

Following specimens are usually examined to establish

a diagnosis:

Stool

Blood

Urine

Sputum

Cerebrospinal fl uid (CSF)

Tissue and aspirates

Genital specimens.

Stool Examination

Examination of stool is very important for the detection

of intestinal infections like Giardia, Entamoeba, Ascaris,

Ancylostoma, etc.

Blood Examination

Examination of blood is of vital importance for demonstrating parasites which circulate in blood vessels. Malarial parasite is confi rmed by demonstration

of its morphological stages in the blood.

Genital Specimen Examination

Trophozoites of T. vaginalis are found in the vaginal and uretheral discharge. Eggs of E. vermicularis are found in anal swabs.

Culture

Some parasites like Leishmania, Entamoeba, and Trypanosoma

can be cultured in the laboratory in various axenic and polyxenic media.

Serological Tests

Serological tests are helpful for the detection and surveillance of many protozoal and helminthic infections.

These tests are basically of 2 types:

- Tests for antigen detection,
- Tests for antibody detection

Molecular Diagnosis

Moleculular method most frequently used to diagnose human parasitic infection are DNA probes, polymerase chain reaction (PCR), and microarray technique. These tests are very sensitive and specifi c.

Animal Inoculation

It is useful for the detection of Toxoplasma, Trypanosoma, and Babesia from the blood and other specimens.

Xenodiagnosis

Some parasitic infection like Chagas' disease caused by T. cruzi can be diagnosed by feeding the larvae of reduviid bugs with patients blood and then detection of amastigotes of T. cruzi in their feces.

Imaging

Imaging procedures like X-ray, ultrasonography (USG) computed tomography (CT) scan and magnetic resonance Imaging (MRI) are now being extensively used for diagnosing various parasitic infection like neurocysticercosis and hydatid cyst disease