Tikrit University

College of Nursing

Basic Nursing Sciences

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Microbiology

Parasitology

Parasite having direct life cycle

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Parasites having direct life cycle

Protozoa

- *Entamoeba histolytica*
- *Giardia lamblia*
- *Trichomonas vaginalis*
- *Balantidium coli*
- *Cryptosporidium parvum*
- *Cyclospora cayetanensis*
- *Isospora belli*
- *Microsporidia*

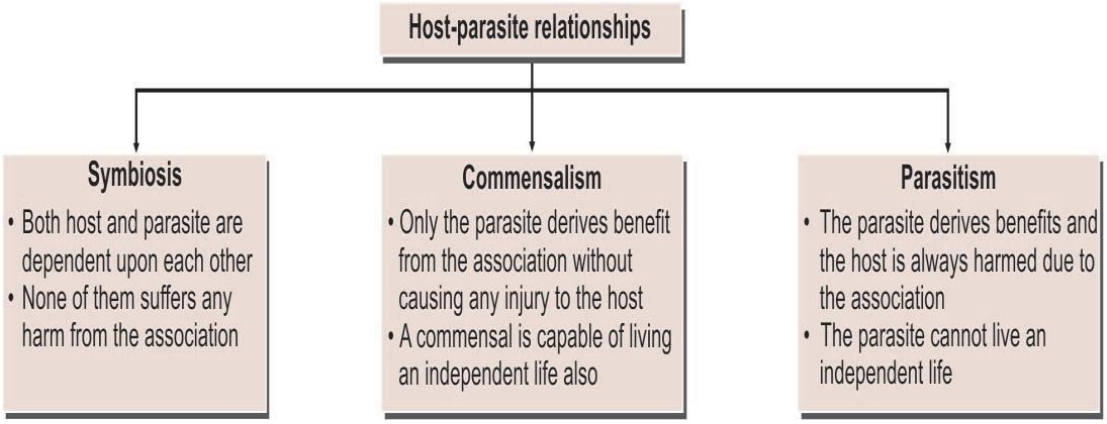
Helminths

- *Ascaris lumbricoides*
- *Enterobius vermicularis*
- *Trichuris trichiura*
- *Ancyclostoma duodenale*
- *Necator americanus*
- *Hymenolepis nana*

Parasites having indirect life cycle

Parasite	Definitive host	Intermediate host
Protozoa		
Plasmodium spp.	Female Anopheles mosquito	Man
Babesia	Tick	Man
Leishmania	Man, dog	Sandfly
Trypanosoma brucei	Man	Tsetse fly
Trypanosoma cruzi	Man	Triatomine bug
Toxoplasma gondii	Cat	Man
Cestodes		
Taenia solium	Man	Pig
Taenia saginata	Man	Cattle
Echinococcus granulosus	Dog	Man
Trematodes		
Fasciola hepatica	Man	Snail
Fasciolopsis buski	Man, pig	Snail
Schistosoma spp.	Man	Snail
Nematodes		
Trichinella spiralis	Man	Pig
Wuchereria bancrofti	Man	Mosquito
Brugia malayi	Man	Mosquito
Dracunculus medinensis	Man	Cyclops

Host-parasite Relationships
Host-parasite relationships are of following types:
*Symbiosis
*Commensalism
*Parasitism
.
Direct life cycle:
When a parasite requires only single host to complete its development, it is called as direct life cycle, e.g. Entamoeba histolytica requires only a human host to complete its life cycle.
Indirect life cycle:
When a parasite requires 2 or more species of host to complete its development, the life cycle is called as indirect life cycle, e.g. malarial parasite requires both human host and mosquito to complete its life cycle



Sources of Infection

Contaminated soil and water:*

Soil polluted with embryonated eggs (roundworm, whipworm) may be ingested or infected larvae in soil, may penetrate exposed skin (hookworm). Infective forms of parasites present in water may be ingested (cyst of amoeba and Giardia)

Water containing the intermediate host may be swallowed (cyclops containing guinea worm larva Dracunculus Medinensis). Infected larvae in water may enter by penetrating exposed skin, (cercariae of schisotosomes) €Free-living parasites in water may directly enter through vulnerable sites (Naegleria may enter through nasopharynx).

Food: *

Ingestion of contaminated food or vegetables containing infective stage of parasite (amoebic cysts, Toxoplasma oocysts, Echinococcus eggs) Ingestion of raw or under-cooked meat harboring infective larvae (measly pork containing cysticercus cellulosae, the larval stage of Taenia solium).

Insect vectors:*

A vector is an agent; usually an arthropod that transmits an infection from man to man or from other animals to man, e.g., female Anopheles is the vector of malarial parasite.

Sample collection

Patient is asked to pass stool in a clean container.*

Stool should be collected in a sterilized, wide mouthed container.*

Stool portion containing mucus, blood, etc. is to be collected.*

Should be uncontaminated with urine or any other body secretions.*

*> 2 gm is required.

*Properly named and always a fresh sample should de tested.

* Liquid stool to be examined within ½ hour.

*Solid stool to be examined within 1 hour.

*If delayed store in a refrigerator.

*3 samples of stool within 10 days to exclude false negatives.

*Formalin is the best preservative. It kills the bacteria but preserves the protozoa and helminths.

*For culture no preservative to be used.

Samples we need for detection about the parasites are:

*Stool (E. histolytica, G. lamblia, …ect.)

* Urine (S. heamatobium,… etc)

* Blood (Plasmmodium, leishmania spp., Trypanosoma)

*Sputum (Larval stages of Ascaris, Strongyloides)
*Biopsies :(Direct microscopic examination of muscle (Trichinella spiralis) or intestinal / bladder mucosa (Schistosoma eggs, Entamoeba).
*Aspirates and Biopsies : (for Giardia lamblia and Strongyloides stercoralis).
*Abscess aspirates - usually for extra-intestinal amoebiasis (liver aspiration)
* Anal Swabs: (Enterobius vermicularis & other helminth eggs can be seen)
* Genital Specimens :(Trichomonas vaginalis - vaginal, urethral, prostatic exudates, looking for motile organisms).