Protozoa

Amoebas

Can alter shape; move via pseudopods

Entamoeba histolytica

Disease:

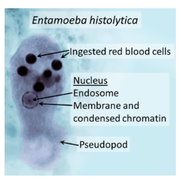
Amebiasis-bloody diarrhea (dysentery, liver abscess, RUQ pain, histology of colon biopsy shows flask-shaped ulcers

Transmission:

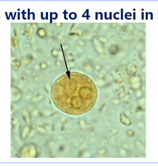
Cysts in water (Organisms that are acquired as cysts in fresh water are ECG- Entamoeba, Cryptosporidium, Giardia)

Diagnosis: (antigen detection PCR)

Trophozoits(with engulfed RBCs in the cytoplasm



Cysts with up to 4 nuclei in stool



Treatment:

Metronidazole; paromomycin or iodoquinol for asymptomatic cyst passers

Acanthamoeba

Causes keratitis (inflammation of the cornea) and encephalitis

Naegleria fowleri

Disease:

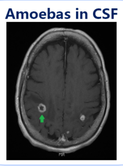
Causes rapidly progressive meningoencephalitis and death within 1-2 weeks in nearly 100% patients

Transmission:

Swimming in warm freshwater; enters via cribroform plate

Diagnosis:

Amoebas in CSF



Treatment:

Amphotericin B has been effective for a few survivors

Flagellates

Move using flagella

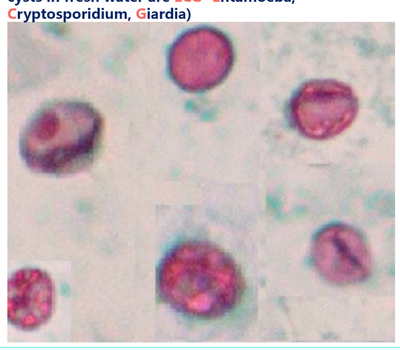
Giardia lamblia

Disease:

Giardiasis- bloating, flatulence, foul-smelling, nonbloody, fatty diarrhea (often seen in campers/hakers)

Transmission:

Cysts in water (Organisms that are acquired as cysts in fresh water are ECG- Entamoeba, Cryptosporidium, Giardia)



IgA deficiency are at increased risk of giardia infection

Diagnosis: (antigen detection PCR)

Multinucleated trophozoites

Cysts in stool

Treatment:

Metronidazole

Trichomonas vaginalis

Disease:

Vaginitis-foul-smelling, greenish discharge; itching and burning; do not confuse with gardnerella vaginalis, a garm-variable bacterium associated with bacterial vaginosis

Transmission:

Sexual(cannot exist outside human because it cannot form cysts)

Diagnosis:

Trophozoites (motile) on wet mount; punctuate cervical hemorrhages ("strawberry cervix")

Treatment:

Metronidazole for patient and patient(s) (prophylaxis; check for STI)

Trypanosoma cruzi

Disease:

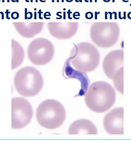
Chagas disease: dilated cardiomyopathy with apical atrophy, megacolon, megaesophagus Unilateral periorbital swelling (Romana sign) characteristic of acute stage

Transmission:

Triatomine insect (kissing bug) bites and defecates around the mouth or eyes- fecal transmission into bite site or mucosa

Diagnosis:

Triatomine insect (kissing bug) bites and defecates around the mouth or eyes- fecal transmission into bite site or mucosa



Treatment:

Benznidazole or nifurtimox

Trypanosoma brucei

Disease

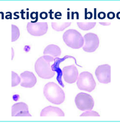
African sleeping sickness-enlarged lymph nodes, recurring fever (due to antigenic variation, somnolence, coma

Transmission;

Tsetse fly, a painful bite

Diagnosis:

Trypomastigote in blood smear



Treatment:

Suramin for blood-borne disease or Melarsoprol for CNS penetration

Leishmania

Disease:

Visceral leishmaniasis (kala-azar)

Spiking fevers, hepatosplenomegaly, pancytopenia

Cutaneous leishmaniasis

Skin ulcers

Transmission:

Sandfly

Diagnosis:

Macrophage containing amastigotes

Treatment:

Amphotericin B, sodium stifogluconate

Sporozoans

Have spore-forming phase; produce apical complex

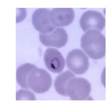
Plasmodium

Disease:

Malaria—cyclic fevers, headache, anemia, splenomegaly; hypoglycemia in severe disease

P malariae

72-hr fever cycle (quartan), Blood smear with trophozoite ring within RBC

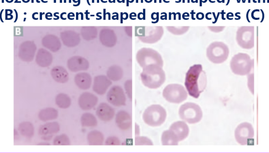


P vivax/ovale

48-hr fever cycle (tertian); dormant form (hypnozoite) in liverBlood smear with trophozoites and Schüffner stippling (small red granules) within RBC cytoplasm, Add primaquine to target hypnozoites

P falciparum

Severe, irregular fever pattern; parasitized RBCs may occlude capillaries in brain (cerebral malaria), kidneys, lungsBlood smear with trophozoite ring (headphone shaped) within RBC (B) ; crescent-shaped gametocytes (C)



Transmission:

Anapheles mosquito

Treatment:

If sensitive, chloroquine; if resistant, mefloquine, doxycycline or atovaquone/ proguanil
If life threatening, use intravenous quinine or artesunate (test for G6PD deficiency)

Toxoplasma gondii

Disease:

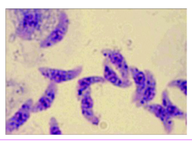
Immunocompetent: mononucleosis-like symptoms, ═heterophile antibody test
Reactivation in AIDS-brain abscesses usually seen as multiple ring-enhancing lesions on MRI,
Congenital toxoplasmosis: classic triad of chorioretinitis, hydrocephalus, and intracranial calcifications

Transmission:

Classical acquired from contact with infected cats, or via consumption of pork, crosses placenta (pregnant patients should avoid cats)

Diagnosis:

Serology, biopsy (tachyzoite, below picture); PCR of amniotic fluid for possible intrauterine disease



Treatment:

Sulfadiazine + pyrimethamine, prophylaxis with TMP-SMX when CD4+ cell count 100 cell/mm3

Cryptosporidium parvum

Disease:

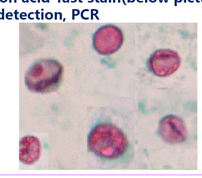
Severe diarrhea in AIDS, mild disease (watery diarrhea) in immunocompetent hosts

Transmission:

Cysts in water (Organisms that are acquired as cysts in fresh water are ECG- Entamoeba, Cryptosporidium, Giardia)

Diagnosis:

Oocytes on acid-fast stain(below picture), antigen detection, PCR



Treatment:

Prevention (by filtering city water supplies); nitazoxanide in immunocompetent hosts

Babesia

Disease:

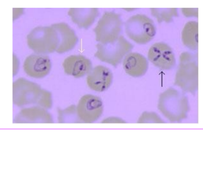
Babesiosis-fever and hemolytic anemia; asplenia increased risk of severe disease due to inability to clear infected RBCs

Transmission:

Ixodes tick (also vector for Borrelia burgdoferi and Anaplasma

Diagnosis:

Blood smear: ring form (white), Maltese cross (black)



PCR

Treatment:

Atovaquone + azitromycin