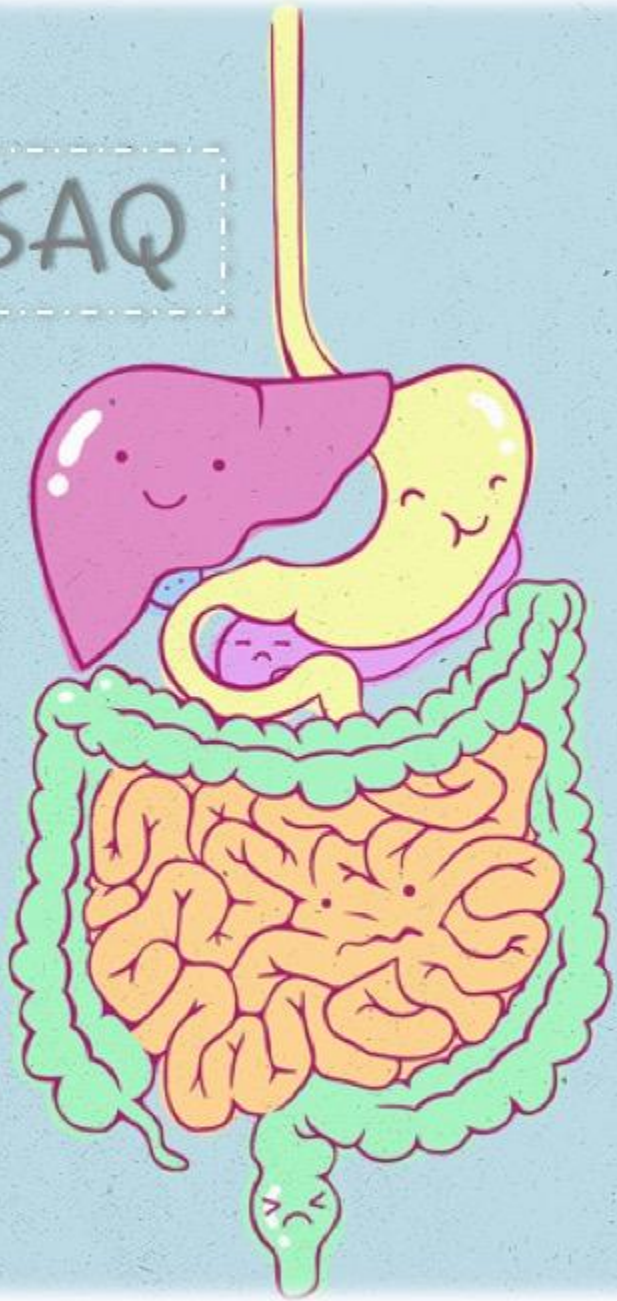
GIT SAQ



Microbiology

IMP. ≈ Important.

Editing File

H pylori and drugs used in treatment

A 60-year-old man presents with hematemesis, melena, guaiac-positive stools, and signs of circulatory collapse. He has a 20-year history of burning midepigastric pain and tenderness relieved by food, milk, or antacids. Also, he has been taking high doses of nonsteroidal anti-inflammatory drugs to relieve the pain of long-standing arthritis.

Q1\ What is the most likely diagnosis?
Peptic ulcer disease 'PUD'

Q2\ What is the most common cause of PUD?
Helicobacter pylori infection

Q3\ Describe the Helicobacter Pylori?
Small, Gram-negative, spiral rods, motile by polar flagella.

Q4\ What is the most common site for this bacteria?
Gastric antrum is the most favoured site, present in the mucus that overlies the mucosa.

Q5\ What can Helicobacter Pylori cause?

1. Chronic active gastritis
2. Gastric and duodenal ulcer (peptic ulcer)
3. Adenocarcinoma
4. (MALT) lymphoma

Q6\ List some signs and symptoms of this disease?

1. Abdominal pain, epigastric with severity relating to mealtime (3 hours after meal with gastric ulcer).
2. Bloating and abdominal fullness.
3. Nausea and vomiting.
4. Loss of appetite and weight loss.
5. Hematemesis
6. Melena

Note: 80% of individuals infected with the bacterium are asymptomatic.

Q7\ H. Pylori produce urease enzyme, what is the role of this enzyme?
urease breaks urea down to C02+NH3

Q8\ H. Pylori has some biochemical reactions mention three of them?

1. Catalase-positive
2. Oxidase-positive
3. Strongly urease-positive.

Q9\ How would you diagnose patient infected by H. Pylori in details?
There are an invasive and non-invasive methods

Non-invasive method:

1. Serology (Blood antibody) tests (IgG, IgM or IgA).
2. Stool antigen test
3. Carbon urea breath test (C^{14} or C^{13}).
4. Polymerase chain reaction (PCR)

Invasive method:

1. Histological examination by taking a biopsy
2. CLO-test
3. Endoscopy followed by culturing the bacteria

Q10\ Some patients are asymptomatic, despite they are infected with H. Pylori, how would you explain that?
Asymptomatic patients carry *H pylori* strains lacking the Cag pathogenesity island (PAI).

Q11\ Mention four factors which are produced by the bacteria that can cause damage to epithelial cells?
1- Ammonia 2- *Proteases* *3- VacA* protein 4- *Phospholipases*

Q12\ What does H. Pylori produce to increase host cell mutation?

1. Free radical
2. TNF-α
3. Interleukin 8

Q13\ What antibiotics that can use to treat the patient in details?
First line therapy
Proton pump inhibitor + clarithromycin + Amoxicillin or Metronidazole 7 days
Second line therapy
Proton pump inhibitor + bismuth subsalicylate/subcitrate + metronidazole 7 days

Q14\ In some cases they use 'Quadruple Therapies', mention one combination, and why they are restricted to use it?
Amoxicillin
Metronidazole
Ranitidine Bismuth Citrate
proton pump inhibitor (Omeprazole)

because it was followed by side effects such as vaginal candidiasis in women and Pseudomembranous colitis.

Normal Flora & Introduction to Infectious Diarrhea

CASE 1\ A 21-year-old medical student came to the emergency at 4 a.m. with abdominal pain and diarrhea. From the history he was studying Microbiology at midnight, after two slides he got bored and he made a bad decision that he went to KFC restaurant and ordered for Box master spicy extra cheese.

What is the most likely diagnosis? Food Poisoning.
Mention three organism that mostly can cause food poisoning?
1-Staphylococcus aureus 2-Clostridium perfringens 3-Bacillus cereus

CASE 2\ 40-year-old male ate a medium done beef burger, after 3 days he developed a bloody diarrhea and he didn't go to the hospital, after 6 days he noticed his urine output is decreased and there is blood in the urine "hematuria", his body temperature raised to 38.

What is the most likely causative organism? Enterohaemorrhagic E. coli (EHEC)
From the history what is the name of syndrome he developed?
Hemolytic uremic syndrome (HUS)=↓Platelet count, hemolytic anemia and kidney failure.

CASE 3\ A 35-year-old male traveled to China, after 2 days he went to the hospital with diarrhea, the lab results showed Gram-negative, oxidase-negative bacilli.

What is the most likely causative organism? Enterotoxigenic E. coli (ETEC)
Mention one toxin that this organism will produce and describe its effect on cells?
Heat-liable toxin (LT) it will increases the cGMP

CASE 4\ 30-year-old-male presented with abdominal cramps, nausea and bloody diarrhea, after taking history you found out that he had rosted turkey 2 days ago.

What is the most likely causative organism? Campylobacter
What's the preferable transport media for diagnostic sampling of this organism?Cary Blair
Mention the complications a chronic carrier of this organism might develop?
Guailian barries' syndrome & Reactive arthritis

CASE 5\ 4-year-old child was known to have a pet, presented to the ED with lower right side abdominal pain and bloody diarrhea he was misdiagnosed with appendicitis.

What is the correct diagnosis? Infectious gastroenteritis
What is the most likely causative organism? Yersinia entrocolitica
According to case 2, 4 and 5 what is the type of diarrhea?Invasive diarrhea

CASE 6\ 43-year-old inpatient who was under antibiotic therapy. Developed fever, abdominal pain and diarrhea, bacterial toxin was detect in his watery stool he was diagnosed with infectious gastroenteritis.

What is the most likely causative organism? Clostridium difficile
If colon endoscopy was preformed, what are you expecting to find?
Psudomembraneous colitis

Cholera

A 9 year old indian male brought to the clinic with severe watery diarrhea, decrease in skin turgor, sunken eyes and cheeks, no abdominal pain and almost no urine production.History reveals his blood type is O. The doctor took sample from the stool and the gram stain shows: red curved rods of becteria and the culture result was large yellow colonies.

Q1)What is the most likely diagnosis and mention other signs of this disease?
Cholera / intravascular volume depletion,hypoklemia and severe metabolic acidosis.

Q2)Describe the shape of bacteria and its incubation period?
Gram negative bacilli and has single polar flagellum / 1-3 days.

Q3)Mention some tests that can be used to distungish this becteria from other becteria and route of transmission ?
Urease and oxidase (positive) / Fecal-oral route.

Q4)Mention the number of serotypes of this becteia and name the toxigenic types ?
Over 150 serotypes / only 2 toxigenic types : O1 and O139

Q5)How much of fluid will loss with this severe diarrhea? 1 L per hour.

Q6)Mention the possible laboratory diagnosis can be used in this case from stool sample?
1- Dark field or phase microscopy (looks like shooting stars)
2-Gram stain : gram negative bacilli
3-Culture on TCBS agar : showing large yellow colonies.

Q7)Mention the best way to treat this patient in this case?
Rehydration (replace the lost fluid and electrolytes) and use Tetracyline or Doxycyline with rehydration in this case because cholera is more severe than ADRs of these drugs.

Oral rehydration used when less than 10% of body weight while IV rehydration used when patient lost more than 10% or patient is unable to drink water due the vomiting

Q8)Mention the two types of vaccination and talk about each one brifely?
1- Killed whole-cell: adult 50% protection for 6 months while children 25% protection and need multiple doses.
2- Live attenuated: adult 60% protection for 2 years while children protection declines after 6 months) and induces mild cholera symptoms.

From the case risk factors and symptoms

Salmonella and Shigella

Case 1\ A patient came to the clinic having a prolong fever, constipation, the doctor noticed his spleen is enlarged, blood sample confirmed bacteremia, the patient said that one week ago he ate medium done chicken burger.

Q1:What was the bacteria causing this kind of sickness?
Salmonella Typhi "Other S.Enterica subspecies won't cause prolong fever and bacteremia

Q2:Complication of typhoid fever:
-Necrotizing cholecystitis -Bowel hemorrhage and perforation -Pneumonia and thrombophlebitis -Meningitis, osteomyelitis, endocarditis and abscesses.

Q3: Treatment for typhoid fever:
ampicillin - TMP- SMX - Chloramphenicol- Ciprofloxacin & ceftriaxone (only in resistant cases) , treatment for other kinds "self limiting"

Q4: mention the type of antigen structure?
O somatic antigen (or v1 in serotype typhi) (heat-stable)
-H flagellar antigen (heat labile)
K capsular antigen

Case 2\ 9-year-old male came to the ER with rectal prolapsed, his temperature was 39 CBC demonstrated large number of PMNs cells. From the history his mother said 'we went to a restaurant and he ate an egg salad and after 3 days he developed diarrhea with blood, later on something passed from the anus and he couldn't pass stool anymore.

Q1\ What is the most likely diagnosis?Shigellosis

Q2\ What is the most likely causative organism?Shigella

Q3\ Mention the four types of Shigella.
1-S.sonnei (the least severe) 2-S.flexneri 3-S.boydii 4-S.dysenteriae

Q4\ What is the name of toxin that is produced by Shigella? Shiga toxin

Q5\ What is the complication of this disease?
Ileus, obstruction dilatation, toxic mega colon, seizures & HUS

Q6\ How would you treat this patient?
Manual reduction of rectum, and treat the underlying infection by IV Ceftriaxone

Q6\ Acording to case 1 and 2 compare between Salmonella and Shigella briefly
Salmonella: motile gram-negative facultative bacilli non lactose fermenting
Shigella: non-motile gram-negative facultative bacilli non lactose fermenting

Intestinal Helminthes

A 5-year old boy brought to the clinic by his mom, she noticed that her child is emotionaly disturbed and he cannot sleep, he has *peritanal itchning* and also she said that he lost some weight. the physician suspected a GI infection so he asked for a stool sample and it came -ve.
What do you think the causative organism? Enterobius vermicularis. (mostly asymptomatic)

IMP. **What's the best method to conform your diagnosis?** using cellulose adhesive tape.
What's the treatment? Albandazole , Mebendazole
What is The commonest human helminthes infection ? Ascaris lumbricoides found in small intestine

Name one syndrome associated with the infection in the Question obove ?
Loeffler`s syndrome: Larvae in lung, pnumonia, cough, bloody sputum.

What is the common complication of Trichuris trichiura infection in children? Rectal prolapse.

How to diagnose Trichuris trichiura infection & mention the main characteristic of it ?
egg in stool./ characterized by its barrel shape with mucoid plugs at each pole.

IMP. **What's the common complication of Ancylostoma dudenale & Necator americanus (hook worms) ?**
Anemia, due to withdrawal of blood by parasites and hemorrhage from punctured sites leading to severe iron deficiency anemia.

IMP. **Give Two Clinical manifestations of hook worm?**
- Cutaneous manifestation - Chronic nutritional impairment (*severe Iron deficiency anemia*)

Mention 2 features of hook worms. cutting plates and anticoagulant glands.

IMP. **Give ONE features about Strongyloides stercoralis?**
It's an *Autoinfection* "it could convert to the active stage directly"

Who develop Disseminated strongyloidiasis and what is the infective stage of this Worm ?
patient with immunodeficiency / -Filariform larva.

Give ONE feature about Strongyloides stercoralis and Where does adult worm live?
obligatory parasite of man / . in Small intestine .

Where does Taenia solium found ? and In the life cycle of Taenia solium there is formation of….in Pigs muscle ? In pigs & human / Cysticercus bovis in the pigs muscle

What is the cause of T.solium & mention the infective and diagnostic stage?
because of Undercooked beef / infective Cysticerci / Diagnostic eggs or gravid segment.

IMP. **What is the diagnostic stage of Echinococcus granulosus & mention the site of it ?**
Hydatid cyst in liver.

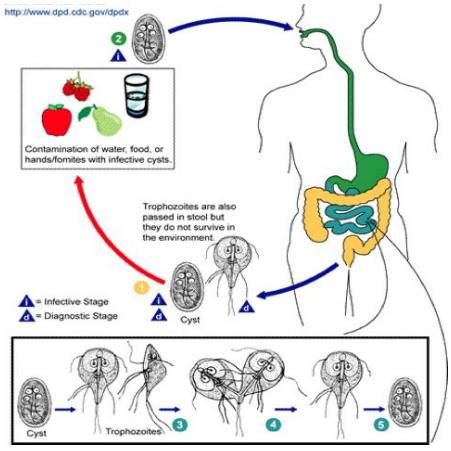
Intestinal Protozoa

What is the major source of giardiasis transmission ?
Water and it is not invasive pathogen (Doesn't invade the mucosal epithelium)

How to diagnose giardiasis ?
By - Microscopy for cysts or trophozoits
- Antigen detection assays

List some Complications of giardiasis ?
- development of malabsorption and weight loss.

Giardia. lamblia lifecycle



Case

IMP. **A 30-year-old male experienced diarrhea for two weeks with fever of 39° C, nausea, vomiting, malaise and right upper abdominal pain. Physical examination revealed hepatomegaly 6 cm below the right costal margin. CT scan showed a single hypodense mass in the rigth lobe of 7.8 x 5.2 cm, round, with well defined borders. Serology was positive for Enamoeba histolytica at 1/512.**

What is your diagnosis ? Amebic liver abscess

IMP. **What are the Clinical manifestation of ENTAMOEBA HISTOLYTICA?**
- majority asymptomatic
- others range from mild diarrhea to severe *amebic dysentery*(bloody diarrhea)
- in Intsetinal amoebiasis there is *Formation of flask-shaped ulcers.*

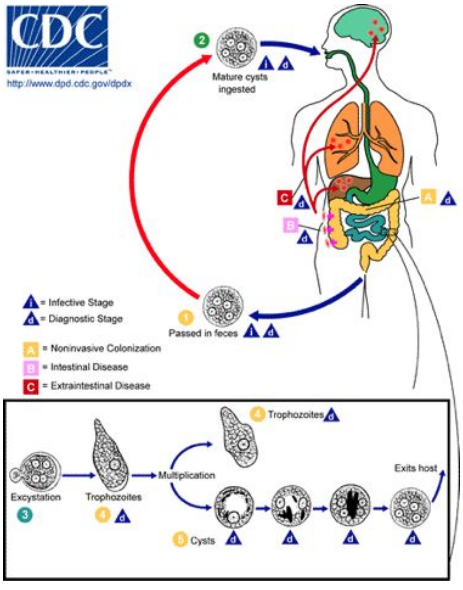
ENTAMOEBA HISTOLYTICA

Mention some complications of ENTAMOEBA HISTOLYTICA?
perforation, blood invasion, direct extension , amoeboma

How to diagnose Amoebiasis?
- Stools : microscopy → Wet mount (cysts and trophozoites)
- molecular methods → Detection of parasitic DNA or RNA in feces
- Serology (mainly for invasive infections): IHA , ELISA.

How to diagnose Cryptosporidium Parvum?
Ag detection in stools stained by acid-fast stain

What is the treatment for Cryptosporidium Parvum?
Paromomyein



Trematodes

What is the cause of schistosomiasis ? caused by infection with parasitic blood flukes

What is the 1 infectious stage , 2 intermediate and 3 definitive host of Schistosoma?
1 Cercariae / 2 Snail / 3 Human

Describe the life cycle of S.mansoni & Japonicum? "in brief "
-S.mansoni & Japonicum goes through portal vein to the GIT.
S.Mansoni goes to Large intestine while S.japonicum to Small intestine .

"Japonicum are small so they go to small intestine"

Describe the life cycle of S. Hematobium? "in brief
Goes via renal plexus to the Urinary bladder.

What are the complications of S.mansoni & S.japonicum ?
1- Portal hypertension. 2- Esophgeal varices . 3- Hepatosplenomegaly.

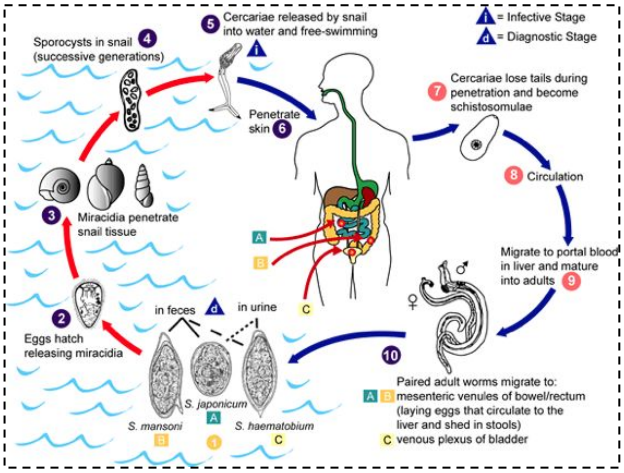
What are the complications of S.hematobium ?
Inflammation & fibrosis of the urinary bladder ,painless hematouria & these may lead to cancer.

How could we diagnose Schistosomiasis? and mention the treatment .
S. haematobium Parasitological → Examination of urine
S. Mansoni Parasitological → Examination of stools
The treatment is Praziquantel

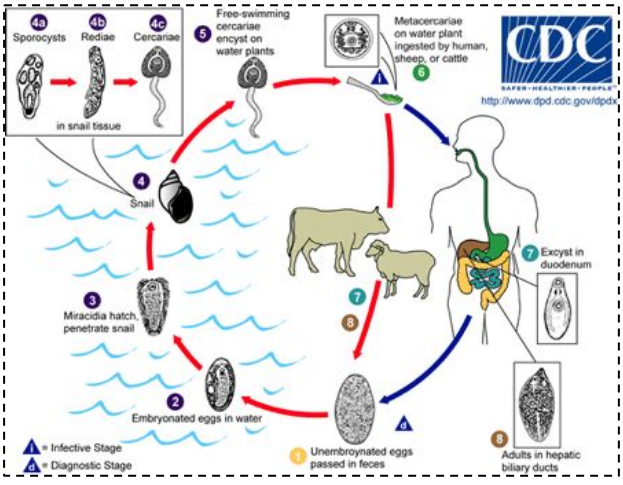
What do they mean by True and False infection in Fasciola hepatica?
- True infection: causes mainly biliary obstruction and liver damage.
- False infection: when eggs are eaten in infected animal liver and passed in stools.

What is the treatment of Fasciola hepatica ?
Triclabendazole.

Schistosomiasis Cycle



Fasciola hepatica Cycle



VIRAL GASTROENTERITIS

List name of a virus cause endemic infection of GE ? Gp A rotavirus mianly in childrean .

List names of a virus cause Epidemic infection of GE ? Norovirus mainly in adult

What is the Genome of Rotavirus , Adenovirus , Calicivirus and Astrovirus ?
1-Rotavirus = ds RNA
2- Adenovirus = ds DNA
3-Calicivirus = ss RNA(+)
4- Astrovirus = ss RNA(+)

What is The most proper way to manage viral GE ? Rehydration.

What is the route of transmission in GE ? Fecal-oral route.

Briefly describe the rotavirus ?
Non-enveloped , Double-layered icosahedral capsid with 11 segments ds-RNA.

List name of vaccine available for rotavirus ?
1-Rotarix: Oral, Live-attenuated, For infants.
2- RotaTeq: Oral, Live-attenuated.

What is the way for Diagnosis GE caused by ADENOVIRUSES?
1-Ag detection in stool by ELISA
2- Immunochromatography Tech.

Briefly describe the Astroviruses ?
transmitted by (water & *shellfish*) Nonenveloped , ssRNA,+ve polarity and Icosahedral capsid

Mention some differences of *Adenoviruses* compared with Rotavirus?
Longer IP.
Less severe
Prolonged illness

Mention the two morphological types of Caliciviruses ?
1- Typical Caliciviruses (Sapoviruses)
2- Small rounded structure viruses (Noroviruses)

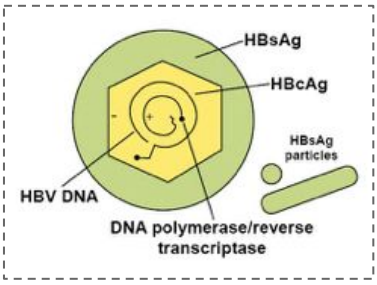
Viral Hepatitis 'B, C, D, & G'

This lecture is Important

A 28-year-old male ER resident was accidentally stuck with a needle from a hepatitis B virus-positive patient. Two months later he began to feel fatigued and lost his appetite. When he ordered a HBV serologic panel, he received the results as follows:

HBsAg + **HBsAb –** **HBcAb +**
HBeAg + **HBeAb –**

What is the status of resident? Acute infection with HBV



What is the structure of HBV?

1-Outer envelope containing hepatitis B surface antigen (HBsAg).

Internal core (nucleocapsid) composed of hepatitis B core antigen (HBcAg).

3-The viral genome which is small partially circular ds-DNA.

What is the routes of transmission? Parentally, Sexually, From mother to the fetus.

Mention the marker of HBV?

1-HB-DNA. 2-HBsAg. 3-HBeAg (**highly contiguous**.) 4-Anti-HBc Ab. 5-Anti-HBs Ab.

How can you diagnose patient with HBV?

1-by detection of HBsAg in the blood. 2-Liver function tests (LFT). 3-Ultrasound of the liver.

4-Liver biopsy IgM anti-HBcAg = Acute infection, IgG anti-HBcAg = Chronic infection

Which type of hepatitis can be a co-infection with HBV and has high mortality rate? HDV, HGV

What is the structure of HCV?outer envelope, Icosahedral core, ss-RNA gemone.

What is the clinical features of hepatitis?

Low grade fever, anorexia, malaise, nausea, vomiting and pain at the right upper quadrant of the abdomen, raised liver enzyme, jaundice, raised bilirubin leading, dark urine and pale stool

What is the treatment?

HBV: Pegylated alpha interferon, Lamivudine, Adevovir.
HCV: Pegylated alpha interferon and ribavirin. (No vaccine available to hepatitis C.)

The clinical outcome of HBV infection ?

★ About **90 %** of infected adults will develop acute hepatitis B infection and recover completely.
★ **< 9 % of the infected adult, 90% of infected infants and 20% of infected children may progress to chronic hepatitis B.**
★ **< 1 %** may develop fulminant hepatitis B, characterized by massive liver necrosis, liver failure and death

Mention the marker that indicates immunity to HB infection.

Anti-HBsAg (Anti-HBs) is the last marker that appears in the blood, It appears few weeks after disappearance of HBsAg and persists for several years.

Haemoflagellates

A 7 year old child presented with anemia, hepatospenomegaly and fever. Not responding to antimalarials and antibiotics.

Differential diagnosis : schistosomiasis

What's your diagnosis? Viscereal leishmaniasis.

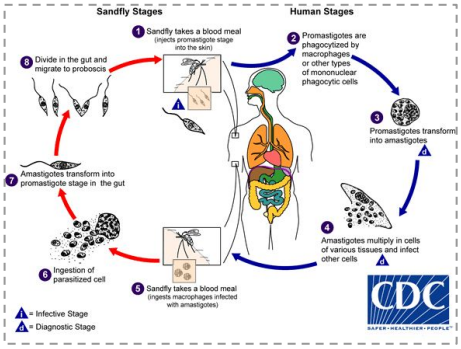
What do you think is the causative organism ?

Leishmania infantum. Leishmania donovani if he was an adult

IMP. **What further examination would you do to confirm your diagnosis?**

bone marrow aspiration → microscopy & culture in NNN medium

ELISA (serology)



What is the appropriate treatment for this infection?

Pentostam, amphotericine B & treating his complecations.

IMP. **Mention parasites can cause cutaneous , Mucocutaneous & Visceral leishmaniasis ?**

cutaneous: 1) Leishmania tropica. 2) Leishmania major

Mucocutaneous: Leishmania braziliensis

Visceral(Kala Azar):1) Leishmania donovani 2) Leishmania Infantum

What is the vector of theses parasites ? Sand fly

Mention some differences between Leishmania tropica & Leishmania major ?

Leishmania tropica	human to human	Dry lesions with minimal ulceration
Leishmania major	animal to human	wet lesions with severe reaction

IMP. **A man present with Focal lymphangitis and oedema at the site of parasites entry, which parasite he has?and; what are these symptoms called?**

He has American trypanosomiasis ; and they are called chagoma.

What is the site of American trypanosomiasis ? Cardiac muscle cell

What is the diagnostic stage?

In blood stream → TRYPTOMASTIGOT

in the tissue it become in form of amastigote

IMP. **Which disease African trypanosomiasis lead to & how to diagnose the disease ?**

Sleeping sickness/ By microscopic examination *(blood or biobsy from Chancre)*

Which type of Trypanosomiases may cause meningoencephalitis? African trypanosomiasis

IMP. **List the clinical picture of African trypanosomiasis ?**

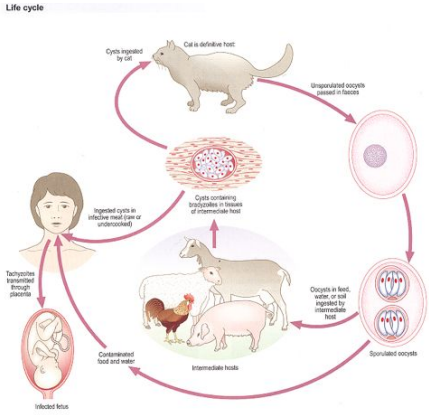
1- A primary reaction occurs at the site of inoculation of Trypanosoma ,skin stage: *chancre*

2- Systemic Haemato-lymphatic stage: *intermittent fever*,headache and generalized lymphadenopathy mainly in the cervical *(Winterbottom's sign)*

3- Central nervous system stage (CNS): Meningoencephalitis.

Toxoplasmosis

To get an infection by Toxoplasmosis gondii The patient must be in which phase ?
when the immunity is decreased → in acute phase (Tachyzoites)



What are the classical triad of the congenital toxoplasmosis ?
- Hydrocephalus
- Intracranial calcification
- Chorioretinitis

List some risk factor related to toxoplasmosis ?
- Presence of cats
- Poor sanitation , mild humid climate
- Food habits
- Pregnancy

How to treat a patient with toxoplasmosis ? and what is the specific test that can be used in pregnancy ?
Sulfonamides and pyrimethamine
Spiramycin: a drug used in France to treat pregnant women
Test : IgG avidity test.

Mention three types of FILARIAL WORMS with their adult and microfilariae site ?
1-Wuchereria bancrofti
Lymphatic filariasis (adults in lymphatics, microfilariae in blood)
2-Loa loa:
Adults in subcutaneous and subconjunctival tissues, causing Calabar swellings.Microfilariae in blood
3-Onchocerca volvulus:
Adults in subcutaneous swellings , Microfilariae : mainly in skin, eyes causing River blindness

What are the main pathology caused by microfilariae and how to diagnose it ?
- Skin: dermatitis
- Lymph nodes: lymphadenopathy
- Eyes: blindness

Diagnosis: skin snip to identify microfilariae.

Mention the role of toxoplasmosis in pregnancy in general ?
- The earlier in pregnancy the mother is infected, the lower is the risk of an infection of the fetus, but the severer is the disease.
- The later in pregnancy the mother is infected, the higher is the possibility of fetal infection, and the disease is less severe (often subclinical infection)

Malaria

A 30 year old male comes to the ER complaining of high continuous fever, chills, sever headache, and confusion. He has recently returned from Africa. A peripheral blood smear reveals multiple ring structures and crescent shaped gametes.

What is the diagnosis? Malaria

What is the most causative organism?
Plasmodium falciparum "continuous fever"

Descibe the malaria life cycle.
1-Mosquito takes a blood and injects sporozoits
2-Travel into hepatocytes & proliferate to form schizont. (inside the hepatocyte)
3-Rapture of the schizont and releasing of the merozoites
4-Merozoits penetrate RBCs & become trophozoites
5-Proliferate inside the RBC to form schizont. (inside the RBC)
6-Rupturing of scizont leads to onset of the symptoms (parasitemia)

What is the infective stages for human and mosquito?
for human is sporozoits
for mosquito is gametocytes

Mention the types of Plasmodium.
1- Plasmodium falciparum 2- Plasmodium vivax 3- Plasmodium ovale
4- Plasmodium malariae 5- Plasmodium knowlesi

List the stages of Malarial Paroxysm.
1- cold stage 2- hot stage 3- sweating stage

Mention four of malaria complications?
1-cerebral malaria 2-sever normocytic anemia 3-jaundice 4-acur renal failure

What are the three developmental stages seen in blood films?
1-Trophozoite 2- Schizont 3- Gametocyte

What are the Laboratory diagnosis of malaria?
1- Microscopy is the gold standard for diagnosis of malaria
2- Rapid diagnostic tests detect malaria antigens
A- Plastic cassette B- Card C- Dipstick D-Hybird cassette-dipsticks

Viral Hepatitis 'A & E'

Mention some viruses that are causing hepatitis during their course of infection.

1- Cytomegalovirus (CMV)
2- Epstein-Barr virus (EBV)
3- Arbovirus (yellow fever virus)

What is the major route of transmission in HAV?

Faecal-oral route [major route] Contaminated food &water

How to diagnose HAV & HEV ?

HAV : Serology: Anti-HAV IgM → Current inf
Anti-HAV IgG → previous infection & immunity
HEV : ELISA → Anti-HE IgM

How to manage a pateint with HAV ?

Treatment: Supportive therapy
Prevention: Sanitation & hygiene measure , HIg & Vaccine

What are the routes of transmission in HEV?

1- Waterborne* 2- Zoonotic foodborne 3- Bloodborne 4- Perinatal

Mention some differences between HAV and HEV ?

HAV	*Short* incubation hepatitis	- Fulminant (*rare*) -Infectious hepatitis	- Epidemic hepatitis - Mortality rate ~ 0.1 - 0.3% (low) - No chronicity or malignancy changes
HEV	*Longer* IP =4-8 Ws	Fulminant disease	Mortality rate ~10 times > HAV

Name the Virus that has *oncogenic* properties then mention the route of Transmission.

Epstein – Barr Virus EBV / transmitted by Saliva [kissing disease]

How to diagnose Epstein – Barr Virus (EBV) & Cytomegalovirus (CMV) ?

EBV: Hematology → lymphocytosis (inc. WBC) | Serology → (specific) IgM Abs to EBV capsid antigen.
CMV: Histology → Intranuclear inclusion bodies [Owl's –eye] Culture & Serology .

How to Diagnose and prevent Yellow Fever ?

Diagnose : Lab. Methods: A- Isolation B - IgM -AB - ELISA, IF: (most used).
Prevent : vaccine (LAV, one dose /10 yrs)

List some differences between Jungle & Urban Yellow Fever ?

Jungle	Vector: mosquito	- Reservoir: *Monkey* - Accidental host: human	It is a disease of *Monkeys*
Urban		Reservoir: *human*	It is a disease of *humans*

DONE BY:

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- Nawaf Alotaibi
- Omar alayed
- Sarah Nasser Aljasser
- Shikhah Aldossari
- Khalil Al-hendas
- Sarah Alsalman.