

Tropical diseases I.



Environmental influences on health in tropical countries

1. natural conditions

- Climate (temperature, humidity, flooding)
- Vectors-insects, rodents – reservoir
- genetic factors - HLA

2. socioeconomic

- The population density
- Poverty, malnutrition, eating habits
- Tradition in housing, water and waste
- Migration
- Lifestyle

Travel Medicine

- Travel medicine is devoted to the health of travelers who visit foreign countries
- Is concerned with the prevention of health risks (especially infectious diseases) during travel
 - pre-travel preventative care of persons
 - the diagnosis and treatment of illnesses acquired while traveling

Health risks for Travelers

1. accidents and injuries
2. diarrhea
3. respiratory infections
4. skin diseases
5. malaria
6. VHA
7. STD: gonorrhoea
8. VHB
9. typhoid fever
10. parasites

Pre-travel advice



Traveler's thrombosis prevention

- Exercise ankles and calf muscles
- Compression stockings – for higher risk
- LMWH - for highest risk
- Aspirin not effective

The biggest risk for transmission of infections

- Drinking water and food - GIT infections, typhoid, HA
- Freshwater lakes - schistosomiasis
- Soil - parasites (Hookworms - ancylostoma)
 - to avoid walking barefoot
- Insects (mosquitoes, fleas) - malaria, HF, maleus,
- Rodents - reservoir (Lassa, Ebola, leishmaniasis)
- Sexual intercourse - HIV, HB, syphilis
- Animals – Rabies, Ebola
- Low levels of health facilities

General measures to avoid infections

1. Measures to prevent insect bites
2. Chemoprophylaxis of malaria
3. Measures to prevent infections from food and water
4. Prevention of sexually transmitted infections
5. Prevention of blood-borne infections
6. prevention of schistosomiasis
7. Immunization
8. Advice for self-treatment

Avoiding insect-borne infections

- Sleep in the protected, properly screened rooms, use insect repellent, or use mosquito nets impregnated with permethrin
- Wear long sleeves and trousers after sunset
- Use an effective insect repellent containing DEET (25-50%)
- Aedes mosquito bites primarily at dawn and dusk.
- In Africa, between 15 ° north latitude and 20 ° south latitude risk of tsetse flies bite , bites during the day. Wear long clothes, do not open the car windows.
- Loiasis - in endemic areas can be prevented by taking 300mg diethylcarbamazin weekly

Chemoprophylaxis of malaria

The risk to travelers is:

- highest
 - In Oceania and Sub-Saharan Africa
 - (estimated at 1:5 and 1:50 per month of stay, respectively, among persons not using chemoprophylaxis)
- intermediate
 - Indian subcontinent and in Southeast Asia
 - (1:250–1:1000 per month)
- low
 - In South and Central America
 - (1:2500–1:10,000 per month).

Of the more than 1000 cases of malaria reported annually in the United States, 90% of those due to *Plasmodium falciparum* occur in travelers returning or immigrating from Africa and Oceania.

Chemoprophylaxis of malaria

- worldwide increase in chloroquine- and multidrug-resistant falciparum malaria
- decisions about chemoprophylaxis have become more difficult.

Avoiding food- and water-borne infections

- Choose food which have been freshly prepared and thoroughly cooked
- Avoid consumption of shellfish and meat that is not well cooked, unpasteurized milk and milk products
- Avoid salads, fruits that can not be peeled, ice and ice cream
- Drinking water should be boiled, or chemically disinfected (with iodine or chlorine)

Food- and water-borne infections

- **Raw meat:** salmonellosis, campylobacter., toxoplasmosis, trichinosis, cysticercosis
- **Water and ice cube:** salmonellosis, thyphoid fever, shigellosis, leptospirosis, amebiasis, giardiasis, hepatitis A
- **Unpasteurized milk:** salmonellosis, brucellosis, campylobacter., TBC
- **Raw fish and shellfish:** salmonella, HA, fish roundworm infection, gnathostomiasis, liver and lung flukes

Avoiding blood-borne and ST infections

- In Africa is the highest incidence of HIV, 5% of the population is affected, in some countries 20% or more
- Procedures involving surgery, injections or blood transfusion may transmit HIV, malaria or HBV
- The high prevalence of HB, syphilis and gonorrhoea
- Condoms reduce but does not abolish risk

Avoiding schistosomiasis

- Schistosomiasis is acquired by bathing in fresh water containing snails
- Risk is highest in the Nile Valley, Lake Victoria, Lake Malawi, artificial lakes in Africa , Tigris and Euphrates river system, some areas of Brazil
- Minimize risk by bathing for short periods in flowing rather than still water, avoiding the early and late parts of the day, and rubbing down vigorously with a towel swimming

Immunization

- Polyo, diphtheria, tetanus – should be reviewed regardless of destination
- Travellers to areas of poor hygiene: require immunization against Hepatitis A and Typhoid (im polysaccharide vaccine or live oral),
- Yellow fever - a live vaccine, single dose.
 - Vaccination is legal requirement for entry to some countries (Sub-Saharan Africa and equatorial South America)
 - It is applied in certified centers, is valid for 10 years from 10 days after immunization
- Meningococcal disease (Africa, Saudi Arabia)
- Japanese encephalitis

Immunization

- Hepatitis B – health care workers and long stay
- Rabies - especially cyclists, animal workers, bat handlers
- TBC – should be offered to tuberculinnegative and unvaccinated visitors to Asia, Africa, C & S America
- Cholera and plague - low efficiency, it is not more recommended

Timing of vaccinations

- Should be ideally started 6-8 weeks before traveling
- After administration of a live vaccine (yellow fever), the distance of at least 4 weeks
- Inactivated vaccines could be administered at once
- Efficacy starts after 10-14 days
- Record in The International Certificate of Vaccination

Medical problems after return

- The most common medical problems encountered by travelers after their return home
 - Diarrhea
 - Fever
 - Respiratory illnesses
 - skin diseases
- Frequently ignored problems are
 - fatigue and
 - emotional stress

Travelers' diarrhea (TD)

- is the most predictable travel-related illness.
- Attack rates range from 30% to 70% of travellers
 - depending on the destination
 - and season of travel - much higher TD attack rates are reported during the hot months preceding the monsoon.
- Traditionally, it was thought that TD could be prevented by following simple recommendations such as “boil it, cook it, peel it, or forget it,”
- but studies have found that people who follow these rules may still become ill.
- Poor hygiene practice in local restaurants is likely the largest contributor to the risk for TD.

TD - Occurrence

The world is generally divided into 3 grades of risk: low, intermediate, and high.

- **Low-risk countries** include the United States, Canada, Australia, New Zealand, Japan, and countries in Northern and Western Europe.
- **Intermediate-risk** countries include those in Eastern Europe, South Africa, and some of the Caribbean islands.
- **High-risk** areas include most of Asia, the Middle East, Africa, Mexico, and Central and South America.

TD - etiology

- **Bacterial** pathogens are the predominant risk, thought to account for **80%–90%** of TD.
- Intestinal **viruses** usually account for **5%–8%** of illnesses
- Infections with **protozoal** pathogens are slower to manifest symptoms and collectively account for approximately **10%** of diagnoses in **longer-term travelers**.

Infectious agents - Bacteria

- are the most common cause of TD.
- enterotoxigenic *Escherichia coli*
 - Overall, the most common pathogen (60%)
 - followed by
- *Campylobacter jejuni*
- *Shigella* spp.
- *Salmonella* spp.
- Enteroadherent and other *E. coli* pathotypes
- *Aeromonas* spp. and *Plesiomonas* spp. probably potential causes of TD
- *Vibrio cholerae*

Infectious agents - viruses, parasites

- Viral diarrhea - norovirus, rotavirus, astrovirus.
- *Giardia* is the main protozoal pathogen
- *Entamoeba histolytica* is a relatively uncommon pathogen in travelers.
- *Cryptosporidium* is also relatively uncommon.
- *Cyclospora* - the risk is highly geographic and seasonal: risks are in Nepal, Peru, Haiti, and Guatemala.
- *Dientamoeba fragilis* is occasionally diagnosed in travelers.

Prevention - FOOD

- **FOOD** - In areas where hygiene is inadequate select food with care!!! All raw food is subject to contamination.
 - To avoid eating
 - Raw or undercooked meat, fish, and shellfish
 - salads, uncooked vegetables, unpasteurized juices, milk and milk products
 - To eat only food that is fully cooked and served hot
 - Fruit – to eat fruit that has been washed in clean water and then peeled by the traveler. Raw fruits that are eaten unpeeled (such as strawberries) or cut should be avoided

Prevention - HANDS and WATER

- **HANDS** - wash hands with soap and water before eating... If soap and water are not available, use an alcohol-based hand sanitizer (with $\geq 60\%$ alcohol)
- **WATER** - tap water in some places may be unsafe for drinking, preparing food and beverages, making ice, cooking, and brushing teeth.

Prevention - medication

- Probiotics
- Antibiotics
 - are effective in the prevention of some TD, but should not be recommended for most travelers.
 - Prophylactic antibiotics may be considered for short-term travelers
 - who are high-risk hosts (such as those who are immunosuppressed) or
 - who are taking critical trips (such as engaging in a sporting event) during which even a short bout of diarrhea could affect the trip.
 - Rifaximin - nonabsorbable antibiotic

Self-treatment

- Travelers' diarrhea often occurs despite rigorous food and water precautions
- An antibiotic is useful in reducing the frequency of bowel movements and duration of illness
 - Quinolones bid, 3 days
 - Azithromycin 500 mg 3 days
 - Rifaximin
 - a poorly absorbed rifampin derivative, is highly effective against noninvasive bacterial pathogens such as toxigenic and enteroaggregative *E. coli*

Questions - Tropical medicine

1. AIDS in tropical countries.
2. Haemorrhagic fever (Lassa, Ebola, Marburg diseases).
3. Yellow fever.
4. Viral hepatitis in tropical countries.
5. Plague.
6. Travelers' diarrhea.
7. Cholera.
8. Giardiasis, amoebiasis.
9. Malaria.
10. Leishmaniasis.
11. Schistosomiasis (Bilharziasis).
12. Typhoid and paratyphoid fever.
13. African sleeping sickness and Chagas' disease.
14. Pre-travel advice and immunisation.
15. TBC in tropical countries.