 ALPHA UNIVERSITY BORAMA

FACULTY OF HEALTH SCIECEN

**DEPARTMENT OF PUBLIC HEALTHS AND PHARMACTY**

**COURSE: COMMMUNICABLE DISEASE**

**ASSIGMENT**

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**TITLE:** **Arthropod borne infection**

1. **Introduction to Arthropod borne infection**

Arthropod-borne infections, also known as arboviral diseases, are illnesses transmitted to humans and animals through the bites of infected arthropods, primarily mosquitoes and ticks. These infections can cause a range of illnesses, from mild febrile conditions to severe diseases resulting in neurological complications or death.

**Types of Arthropod borne infection**

rthropod-borne infections can be categorized based on the type of pathogen (virus or bacteria) and the vector involved. Here are some key types:

**1. Viral Infections**

* **Dengue Fever**
  + **Vector**: Aedes mosquitoes
  + **Symptoms**: High fever, severe headache, joint pain, rash.
* **Zika Virus**
  + **Vector**: Aedes mosquitoes
  + **Symptoms**: Mild fever, rash, conjunctivitis; linked to birth defects.
* **West Nile Virus**
  + **Vector**: Culex mosquitoes
  + **Symptoms**: Often asymptomatic; can cause fever, neurological disorders.
* **Chikungunya**
  + **Vector**: Aedes mosquitoes
  + **Symptoms**: Severe joint pain, fever, rash.
* **Yellow Fever**
  + **Vector**: Aedes and Haemagogus mosquitoes
  + **Symptoms**: Fever, chills, loss of appetite; can lead to severe liver damage.
* **Japanese Encephalitis**
  + **Vector**: Culex mosquitoes
  + **Symptoms**: Fever, headache, neurological symptoms; can cause encephalitis.

**2. Bacterial Infections**

* **Lyme Disease**
  + **Vector**: Ixodes ticks
  + **Symptoms**: Fever, headache, fatigue; characterized by a circular rash.
* **Rocky Mountain Spotted Fever**
  + **Vector**: Dermacentor ticks
  + **Symptoms**: Fever, rash, headache; can be severe if untreated.
* **Tularemia**
  + **Vector**: A variety of arthropods, including ticks and deer flies
  + **Symptoms**: Fever, skin ulcers, swollen lymph nodes.
* **Anaplasmosis**
  + **Vector**: Ixodes ticks
  + **Symptoms**: Fever, chills, muscle aches; can lead to severe illness.

**3. Protozoan Infections**

* **Malaria**
  + **Vector**: Anopheles mosquitoes
  + **Symptoms**: Fever, chills, sweating; can be life-threatening.
* **Leishmaniasis**
  + **Vector**: Sandflies
  + **Symptoms**: Skin lesions, or visceral disease affecting internal organs

**Sing and symptoms Arthropod borne infection**

The signs and symptoms of arthropod-borne infections can vary widely depending on the specific disease, the pathogen involved, and the individual’s health. Here are common presentations for several key arthropod-borne infections:

**1. Dengue Fever**

* **Symptoms**:
  + High fever
  + Severe headache
  + Joint and muscle pain
  + Rash
  + Nausea and vomiting

**2. Zika Virus**

* **Symptoms**:
  + Mild fever
  + Rash
  + Conjunctivitis (red eyes)
  + Joint pain
  + Muscle pain

**3. West Nile Virus**

* **Symptoms**:
  + Often asymptomatic
  + Fever
  + Headache
  + Body aches
  + Neurological symptoms (in severe cases), such as confusion or paralysis

**4. Chikungunya**

* **Symptoms**:
  + Sudden high fever
  + Severe joint pain (often debilitating)
  + Muscle pain
  + Rash

**5. Yellow Fever**

* **Symptoms**:
  + Fever
  + Chills
  + Loss of appetite
  + Nausea and vomiting
  + Jaundice (in severe cases)

**6. Japanese Encephalitis**

* **Symptoms**:
  + Fever
  + Headache
  + Vomiting
  + Confusion
  + Neurological symptoms (in severe cases)

**7. Lyme Disease**

* **Symptoms**:
  + Fever
  + Fatigue
  + Headache
  + Circular rash (erythema migrans)

**8. Rocky Mountain Spotted Fever**

* **Symptoms**:
  + Fever
  + Rash (often begins at wrists and ankles)
  + Headache
  + Muscle pain

**9. Malaria**

* **Symptoms**:
  + Fever
  + Chills
  + Sweating
  + Headache
  + Fatigue

**Common Arthropod-Borne Infections**

Here are some of the most prevalent arthropod-borne infections, including their causative agents and vectors:

**1. Dengue Fever**

* **Causative Agent**: Dengue virus (four serotypes)
* **Vector**: Aedes mosquitoes (primarily Aedes aegypti)
* **Regions**: Tropical and subtropical areas

**2. Zika Virus**

* **Causative Agent**: Zika virus
* **Vector**: Aedes mosquitoes (especially Aedes aegypti)
* **Regions**: Tropical and subtropical regions; outbreaks have occurred globally

**3. West Nile Virus**

* **Causative Agent**: West Nile virus
* **Vector**: Culex mosquitoes
* **Regions**: North America, Europe, Africa, Asia

**4. Chikungunya**

* **Causative Agent**: Chikungunya virus
* **Vector**: Aedes mosquitoes (primarily Aedes aegypti and Aedes albopictus)
* **Regions**: Tropical and subtropical areas

**5. Yellow Fever**

* **Causative Agent**: Yellow fever virus
* **Vector**: Aedes and Haemagogus mosquitoes
* **Regions**: Tropical areas of Africa and South America

**6. Japanese Encephalitis**

* **Causative Agent**: Japanese encephalitis virus
* **Vector**: Culex mosquitoes
* **Regions**: Asia and the western Pacific

**7. Lyme Disease**

* **Causative Agent**: Borrelia burgdorferi (bacteria)
* **Vector**: Ixodes ticks (deer ticks)
* **Regions**: North America, Europe, Asia

**8. Rocky Mountain Spotted Fever**

* **Causative Agent**: Rickettsia rickettsii (bacteria)
* **Vector**: Dermacentor ticks
* **Regions**: North America, especially in wooded areas

**9. Malaria**

* **Causative Agent**: Plasmodium species (protozoan)
* **Vector**: Anopheles mosquitoes
* **Regions**: Sub-Saharan Africa, parts of Asia and South America

**prevention and control of arthropod-borne infections**

Effective prevention and control of arthropod-borne infections involve a combination of strategies aimed at reducing vector populations, minimizing human exposure, and implementing vaccination where available. Here are key measures:

**1. Vector Control**

* **Environmental Management**:
  + Eliminate standing water (breeding sites for mosquitoes).
  + Maintain clean surroundings and dispose of waste properly.
* **Insecticides**:
  + Use of larvicides in water bodies.
  + Spraying adulticides in areas with high mosquito populations.
* **Biological Control**:
  + Introduce natural predators of mosquito larvae (e.g., fish that eat larvae).

**2. Personal Protection**

* **Insect Repellents**:
  + Apply repellents containing DEET, picaridin, or oil of lemon eucalyptus on exposed skin.
* **Protective Clothing**:
  + Wear long-sleeved shirts, long pants, socks, and shoes, especially in endemic areas.
* **Bed Nets**:
  + Use insecticide-treated bed nets (ITNs) while sleeping to protect against nighttime mosquito bites.

**3. Public Health Initiatives**

* **Education and Awareness**:
  + Inform communities about the risks of arthropod-borne infections and prevention strategies.
* **Vaccination**:
  + Vaccines available for certain diseases (e.g., yellow fever, Japanese encephalitis) should be administered where recommended.

**4. Monitoring and Surveillance**

* **Vector Surveillance**:
  + Monitor mosquito populations and disease transmission to identify outbreaks early.
* **Disease Surveillance**:
  + Track human cases to enable timely public health responses.

**5. Travel Precautions**

* **Travel Advisories**:
  + Stay informed about outbreaks in areas you plan to visit.
* **Pre-Travel Vaccination**:
  + Get vaccinated against diseases like yellow fever if traveling to endemic areas.

Diagnosis Arthropod borne infection

Diagnosing arthropod-borne infections involves a combination of clinical evaluation, patient history, and laboratory testing. Here are key aspects of the diagnostic process:

**1. Clinical Evaluation**

* **Symptoms Assessment**:
  + Review of symptoms such as fever, rash, joint pain, and neurological signs.
* **Patient History**:
  + Travel history to endemic areas.
  + Exposure to vectors (e.g., mosquito or tick bites).

**2. Laboratory Testing**

* **Serological Tests**:
  + Detect antibodies against specific viruses or bacteria (e.g., ELISA tests for dengue, Zika, and West Nile viruses).
* **Molecular Tests**:
  + PCR (Polymerase Chain Reaction) tests to identify viral or bacterial DNA/RNA in blood or tissue samples.
* **Blood Smears**:
  + Microscopic examination of blood samples for parasites (e.g., malaria).
* **Culture**:
  + Isolation of pathogens from blood or tissue samples, though this is less common for many arboviruses.

**3. Imaging Studies**

* **CT or MRI Scans**:
  + May be used in cases with neurological symptoms to assess brain involvement (e.g., in Japanese encephalitis).

**4. Differential Diagnosis**

* Consideration of other diseases with similar symptoms (e.g., influenza, other viral infections) to rule out non-arboviral causes

Treatment Arthropod borne infection

The treatment for arthropod-borne infections varies depending on the specific disease, its severity, and the patient’s overall health. Here are common treatment approaches for several key infections:

**1. Dengue Fever**

* **Treatment**: Supportive care is essential.
  + **Hydration**: Oral or intravenous fluids to prevent dehydration.
  + **Pain Relief**: Acetaminophen (paracetamol) for fever and pain. Avoid NSAIDs like ibuprofen and aspirin due to bleeding risks.

**2. Zika Virus**

* **Treatment**: Supportive care.
  + **Symptom Management**: Rest, hydration, and pain relief with acetaminophen.

**3. West Nile Virus**

* **Treatment**: Supportive care.
  + **Symptomatic Treatment**: Hospitalization may be required for severe neurological symptoms; supportive measures include hydration and pain management.

**4. Chikungunya**

* **Treatment**: Supportive care.
  + **Pain Relief**: Acetaminophen or NSAIDs for fever and joint pain.

**5. Yellow Fever**

* **Treatment**: No specific antiviral treatment.
  + **Supportive Care**: Focus on hydration and symptomatic relief. Vaccination is key for prevention.

**6. Japanese Encephalitis**

* **Treatment**: No specific antiviral treatment.
  + **Supportive Care**: Hospitalization for severe cases, including management of neurological symptoms.

**7. Lyme Disease**

* **Treatment**: Antibiotics.
  + **Early Stage**: Doxycycline, amoxicillin, or cefuroxime for 10-21 days.
  + **Late Stage**: Extended antibiotic courses may be necessary for more severe manifestations.

**8. Rocky Mountain Spotted Fever**

* **Treatment**: Antibiotics.
  + **Doxycycline**: Initiated as soon as RMSF is suspected, even before laboratory confirmation.

**9. Malaria**

* **Treatment**: Antimalarial medications.
  + **Plasmodium falciparum**: Artemisinin-based combination therapies (ACTs).
  + **Other species**: Chloroquine or other antimalarials depending on resistance patterns