A Brief overview of Vector-Borne Illness

N5290 The Science of Nursing in the Community

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Global status of major vector-borne diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Population at risk (mill)</th>
<th>Prevalence of disease (country)</th>
<th>Disease distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>215</td>
<td>271</td>
<td>Tropical Americas</td>
</tr>
<tr>
<td>Lassa fever</td>
<td>200</td>
<td>130</td>
<td>Tropical Americas</td>
</tr>
<tr>
<td>Onchocerciasis</td>
<td>290</td>
<td>17</td>
<td>Tropical Americas</td>
</tr>
</tbody>
</table>
| Dracunculiasis   | 22                        | 1                              | Tropical Africa and Asia
| African trypanosomiasis | 50              | (25,000 new cases/year)         | Tropical Africa      |
| Schistosomiasis  | 90                        | 20                             | Tropical Americas    |
| Dengue           | 7                         | 7                              | Tropical Americas    |
| Yellow fever     | 7                         | 7                              | Tropical Americas    |
| Yellow fever encephalitis | 7                  | 7                              | Tropical Americas    |
| Other arboviral diseases | 7                | 7                              | Tropical Americas    |
|                  |                           |                                 |                      |

Global Distribution of Schistosomiasis in Africa and the Americas:  S. mansoni, S. intercalatum

Clinical manifestations of Shistosomiasis

- Severe enlargement of liver and spleen
- Intestinal involvement
  - Abdominal pain
  - Bloody diarrhoea
  - Fatigue
Child infected with Shistosomiasis

Shells of various snail intermediate hosts of schistosomiasis

The life cycle of schistosome parasites

Distribution of lymphatic filariasis in Africa and the Americas

Distribution of lymphatic filariasis in Asia

Clinical Manifestations of Lymphatic Filariasis

- Elephantiasis- hypertrophy, edema and fibrosis esp. in lower extremities
- Vector breeds in organically polluted water
Distribution of onchocerciasis in Africa

Distribution of onchocerciasis in the Americas

Clinical Manifestations of onchocerciasis  (River Blindness)

- Long term exposure to infected black fly bites causes blindness
- Affects river valley communities

A victim of river blindness (onchocerciasis)

Aerial view of an abandoned village in an area affected by onchocerciasis in West Africa

Blackfly, feeding
Visceral leishmaniases: Kalazar

- Parasite affects the internal organs and the disease is likely to be fatal
- Arid, warm environment
- Zoonosis: human disease with animal reservoir, sandflies become infected by rodents and dogs.

Oriental sore (cutaneous leishmaniasis in the Eastern Mediterranean)

- Oriental sore, Aleppo button, Baghdad boil, Delhi sore, espundia, papalmoyo, pian bois
- Lesions frequently on face
- Zoonosis: human disease with animal reservoir, sandflies become infected by rodents, dogs, monkeys.
A case of cutaneous Leishmaniasis

Oriental sore (cutaneous leishmaniasis in the Eastern Mediterranean)

Mosquitoes

Anopheles gambiae, feeding
Global distribution of Malaria

Clinical Manifestations of Malaria

- Fever
- Headache
- Liver and spleen enlargement
- Anemia
- Cerebral malaria can be fatal in 24 hours

Number of cases of Malaria reported by WHO

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<tbody>
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<td>Africa</td>
<td>5,784</td>
<td>6,302</td>
<td>5,768</td>
<td>4,885</td>
<td>3,612</td>
<td>3,113</td>
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<td>Americas</td>
<td>630</td>
<td>716</td>
<td>821</td>
<td>661</td>
<td>681</td>
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<tr>
<td>South-East Asia</td>
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<td>Europe</td>
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<tr>
<td>South-West Pacific</td>
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<td>Western Pacific</td>
<td>3,484</td>
<td>3,667</td>
<td>3,816</td>
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<td>3,563</td>
<td>3,798</td>
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<tr>
<td>Total World</td>
<td>7,056</td>
<td>7,493</td>
<td>7,577</td>
<td>6,951</td>
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<td>7,051</td>
<td>7,551</td>
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</table>

Source: WHO Weekly Epidemiological Record, No. 26 (June 1990)

Distribution of yellow fever in Africa

Distribution of Yellow Fever in the Americas
Dengue Fever

Dengue is a mild viral illness transmitted by mosquitos. Treatment includes rehydration and recovery is expected. A second exposure to the virus can result in Dengue hemorrhagic fever, a life-threatening illness.

Dengue Hemorrhagic Fever

- Severe, potentially fatal infection that occurs when someone with immunity to one type of Dengue virus is infected by a different type. It is spread by certain mosquitos (Aedes aegypti) that bite primarily during the day.
- Worldwide, more than 100 million cases of dengue fever occur every year. A small percent of these develop into Dengue hemorrhagic fever. Most cases in the U.S. are brought in from other countries.
- Risk factors for Dengue hemorrhagic fever include having antibodies to dengue virus from prior infection and being younger than 12, female, or Caucasian.

Dengue Hemorrhagic Fever

- Early symptoms of Dengue hemorrhagic fever are similar to those of Dengue fever.
- After several days the patient becomes irritable, restless, and sweaty. These symptoms are followed by a shock-like state.
- Bleeding may appear as petechiae and ecchymoses.
- Shock may cause death. If the patient survives, recovery begins after a one-day crisis period.

Dengue Treatment

- Because Dengue hemorrhagic fever is caused by a virus for which there is no known cure or vaccine, the only treatment is to treat the symptoms.
- Rehydration with intravenous (IV) fluids is often necessary to treat dehydration.
- IV fluids and electrolytes are also used to correct electrolyte imbalances.
- A transfusion of fresh blood or platelets can correct bleeding problems.
- Oxygen therapy may be needed to treat abnormally low blood oxygen.

Chagas Disease

- insect-transmitted parasitic disease common in South and Central America
- Spread by reduvid bugs
- One of the major health problems in South America, where 20 million people are infected. Due to immigration, approximately 500,000 people in the United States are believed to be infected.

Chagas Disease

- Acute Phase
  - swelling and reddening at the site of infection
  - fever, malaise, and generalized swelling of the lymph nodes.
  - The liver and spleen may become enlarged
- Chronic Phase
  - cardiac disease (cardiomyopathy)
  - digestive abnormalities.
  - Patients may develop congestive heart failure.
Chagas Disease Treatment

• The acute phase should be treated. Benznidazole has been shown to be effective. Experimental treatment may include nifurtimox.

• Treating the chronic phase with antibiotics is not helpful. Instead, the symptoms of heart and intestinal disease should be treated.

Bibliography

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• Dr Steven Lindsay, Durham University, UK A.8