Onchocerca

Dr. Ajit Kumar
Parasitology Department
Bihar Veterinary College
Bihar Veterinary University
Patna-800014 (Bihar)
Morphological Characters:

- **Worms are elongated in shape.**
- **Worms lie in coiled up position in fibrous tissues nodules.**
- **Cuticle is transversely straited and bears spiral thickening.**
- **Microfilariae are found in the skin in the lymph spaces and connective tissues spaces.**
### Family: Onchocercidae

#### Species:

<table>
<thead>
<tr>
<th>Species</th>
<th>Fina host</th>
<th>Intermediate host</th>
<th>Location</th>
</tr>
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<tr>
<td>Onchocerca gibsoni</td>
<td>Cattle and zebu</td>
<td>Midge ((\text{Culicoides pungens}))</td>
<td>Subcutaneous &amp; intermuscular nodules</td>
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<td>Onchocerca gutturosa</td>
<td>Cattle and zebu</td>
<td>Simulium ornatum</td>
<td>Ligamentum nuchae &amp; gastrosplenic ligament</td>
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<td>Onchocerca cervicalis</td>
<td>Horse &amp; mule</td>
<td>Culicoides nubeculosis</td>
<td>Ligamentum nuchae</td>
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<tr>
<td>Onchocerca armillata</td>
<td>Cattle &amp; buffalo</td>
<td>-</td>
<td>Thoracic aortic wall</td>
</tr>
<tr>
<td>Onchocerca volvulus</td>
<td>Man</td>
<td>Simulium spp. (black fly)</td>
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**Life-cycle:**

**Indirect life-cycle**

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Transmission:

- Microfilariae (L₁) are taken by the flies during sucking blood from the infected host.
- Infective larvae (L₃) develop inside the flies.
- Transmission occurs when 3rd stage larvae (L₃) infected flies suck blood of another final hosts.
Onchocerca

Life-cycle:

Life Cycle of Onchocerca cervicalis

Microfilaria live on dermis of skin (larvae of neck threadworm)

Infected horse sheds larvae; larvae enter fly when horse is bitten and can now be transmitted to other horses

Fly bites horse and ingests microfilaria; parasite develops into second stage

Fly bites horse again. Second stage larvae travel to connective tissue in neck and develop into adult worm
Onchocerca

Life-cycle:

1. Ingested by blackfly (Simulium spp.)
2. Penetrates stomach wall
3. Migrates to head and proboscis
4. O. volvulus enters skin through fly bite
5. Mate and produce microfilariae
6. Human host
7. Migrates to subcutaneous tissue
**Pathogenesis:**

Depend upon the *Onchocerca* species:

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| *Onchocerca gibsoni*         | ○ Worm produces nodules or worm nest which contain a coiled-up worm surrounded by fibrous tissue.  
                               | ○ Diameter of nodules may reach up to 5 cm.  
                               | ○ It leads to economic lose due to carcass trimming |
| *Onchocerca gutturosa* & *Onchocerca cervicalis* | It affects mainly liamentum nuchae in which coiled worms deeply lodged. Nodules become calcified which contain degenerated worms. Older lesions show hard nodules and reveal chalky appearance on incision. Lesion also occurs on the head, shoulder, neck and withers. |
| *Onchocerca armillata*        | No clinical signs. Worms found in nodules present on the wall of aorta and atheromatous plaques are commonly seen on the intima. Arotic aneurysms may observed in some cases. |
Pathogenesis & Clinical signs:

1. Microfilariae of *Onchocerca* spp. produce sporadic dermatitis which is called *wahi* and *kasen* in cattle, *summer mange*, allergic dermatitis etc. in horses.

2. In man, *Onchocerca volvulus* caused *river blindness* and nodding syndrome.

*Simulium* spp. (Blackflies) breed along fast-flowing rivers and streams, close to remote villages located near fertile land where people rely on agriculture.
Transmission:

*O. gibsoni* formed nodules in the brisket of a cow

Aortic arch and associated serosa a cow exhibits both calcified and caseous nodules due to *Onchocerca armillata* infection.
Diagnosis:

- On the basis of clinical signs.
- Microscopic examination of skin biopsy sample and sometimes in blood smears revealed microfilariae of worm.
Treatment:

- Microfilaricidal drugs are used in the treatment:
  i. Ivermectin @ 0.2 mg/kg body weight S/C.
  ii. Diethylcarbamazine @ 5-8 mg/kg body weight for 21 days
Control:

- Use of microfilaricidal drugs as prophylaxis in animals
- By controlling intermediate hosts by using insecticides, fly repellant, destroying breeding habitat etc.
THANK YOU