Scabies & Chiggers

Outline
- Background, Taxonomy, History
- Morphology, Distribution, Life Cycle
- Transmission, Symptoms, Diagnosis
- Treatment/Prevention
- Summary (Scabies vs. Chiggers)

Scabies
- Human scabies is caused by an infestation of the skin by human itch mite Sarcoptes scabiei var. hominis (CDC)
- One of the first microorganisms linked to human disease

Figure 1. Sarcoptes scabiei
**Sarcoptes Scabiei**
- Obligate human parasite
- Entire life cycle in humans
- Usually found between fingers and on the wrist

**Figure 2. Characteristic welts of scabies**

**Taxonomy**

*Sarcoptes scabiei*
- Kingdom: Animalia
- Phylum: Arthropoda
- Class: Arachnida
- Subclass: Acari
- Family: Sacroptidae

**Natural History of Scabies**
- Aristotle (384-322BC)
- Previously attributed to “corrupt blood”
- Crusca Academy (1623)
  - Pellicello
Natural History of Scabies

- Dr. Giovan Cosimo Bonomo (1663-1696)
- Discovered the etiological agent, affirmed that it laid eggs and suggested its transmission.

Morphology of Sarcoptes scabiei

- Round, sac-like eyeless mites
- Female Sarcoptes scabiei are 0.30-0.45mm long and 0.25-0.35mm wide

Distribution of Scabies

- Figure 3: Bonomo's drawings, International Journal of Dermatology
- Figure 4: Microscopic view of Sarcoptes scabiei
- Figure 5: Worldwide distribution of Scabies
Norwegian Scabies

- Usually found in immunocompromised, leprosy and mentally retarded patients.
- Large parasite load in the epidermis
- Deep scaly lesions
- Recurrence is very high

Figure 6. A 24 yr old with widespread Norwegian Scabies.
Transmission of Scabies
- Direct skin to skin contact
- Crowded living areas
- Fomites
- Sexually

Symptoms of Scabies
- It can be asymptomatic, 2-6 weeks before symptoms develop
- Pruritus at night
- Pimple-like rash
- Tiny burrows on skin

Scabies Diagnosis
- Complaint of pruritus
- Observation of burrows
- Skin biopsy
The larvae stage of the mite family trombiculidae

The only form that is parasitic

There are numerous species

Figure 7. A chigger

Taxonomy

*Trombicula alfrewdugesi*

- Kingdom: Animalia
- Phylum: Arthropoda
- Class: Arachnida
- Subclass: Acari
- Family: Trombiculidae

They are found worldwide

Different species native to different regions.

North America: *Trombicula alfrewdugesi*

In the United States, they are found mostly in the south, southeast & Midwest.
Morphology of Chiggers

- Larvae stage has 3 pairs of legs
- Adult has 4 pairs of legs
- Orange, yellow or red

Life cycle of chiggers

- They penetrate thin skin, folded & wrinkled skin
- It injects a salivary secretion into the skin
- The skin reacts by forming a tube-like structure called a stylostome
- The feeding process can last up to 3 or 4 days.
Skin itches due to a reaction to the stylostome

Figure 10. Formation of stylostome.

Intense itching & red welts

Figure 11. Characteristic red welts of chiggers.

Described by the Chinese over 2000 yrs ago
Caused by a Orientia tsutsugamushi
Trombicula akamushi and T. deliensis
Rodents serve as reservoirs
Skin rash
Headache
Loss of appetite
Swelling of lymph glands
Muscular aches and pains
**Diagnosis of Scrub Typhus**
- Weil-Felix Test
- Fluorescent Antibody Test
- PCR

**Treatment & Prevention**

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<tr>
<th>Chiggers</th>
<th>Scabies</th>
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<tr>
<td>- Application of benzocaine, hydrocortisone, calamine lotion or other anti-itch lotions.</td>
<td>- Premethrin cream</td>
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<td>- Doxycycline or Chloramphenicol</td>
<td>- Lindane lotion</td>
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<td>- Avoid areas of infestation</td>
<td>- Ivermectin</td>
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<td>- Benzyl benzoate and Ivermectin</td>
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<td>- Keep surroundings clean</td>
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**Scabies vs. Chiggers**
- Scabies burrow into the skin while chiggers do not.
- Scabies can be transmitted from person to person while chiggers cannot.
- The scabies mite completes its entire life cycle on humans while chiggers do not.
References

Giovan Cosimo Bonomo (1663-1696)

Chiggers


Scabies picture http://www.scabieshotline.org/images/scabies-hand.jpg


Sarcoptes scabiei http://www.stanford.edu/group/parasites/ParaSites2009/LeighaWinters_Scabies/LeighaWinters_Scabies.htm