

# Nosocomial Scabies

Dr. Helena Maltezou, Hellenic Center for Disease Control, Greece  
A Webber Training Teleclass

## Nosocomial Scabies

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## 2. Epidemiology of scabies

- Contagious, parasitic dermatosis
- Worldwide distribution - 300 million people annually
- All age - groups, races, social classes
- Epidemics during wars, poverty, poor hygiene, overcrowding, malnutrition, sexual promiscuity
- Outbreaks in overcrowded closed settings : long term care facilities, nursing homes, hospitals, among soldiers, schools

## 3. Etiologic agent

*Sarcoptes scabiei var. hominis* (Arachnida arthropod)  
- Obligate human ectoparasite not a vector of infectious agents

Transmission by fertilized female parasites :  
- Attach in human skin, burrow elicoid tunnels in the epidermis, lay 2 – 3 eggs / day, excretion of an agent that causes intense pruritus

- Maturation to mites : 17 days later
- Females : survive for up to 6 weeks in human bodies
- Males : die after a short time

Survives in the inanimate environment for 4 - 5 days

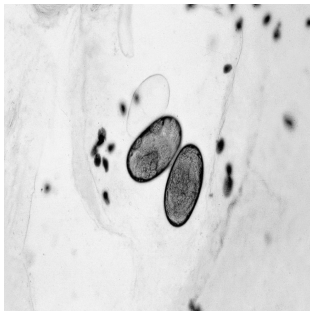
- Not visible

## 4. Scabies mite



FIG. 38.1. The itch mite, *Sarcoptes scabiei*.

## 5. Scabies eggs



## 6. Transmission

- Person – to – person through direct skin contact  
Persistent contact is required
- Transmission among sexual partners
- Intra - family transmission ( attack rates: up to 38% )
- Sharing of clothes, linens, beds etc (crusted scabies)

Classic scabies : 10 - 15 female mites / case

Crusted ( Norwegian ) scabies : 2 million mites / case

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#### 7. Transmission ( cont )

- Patients with crusted scabies act as a reservoir for the mite : the crusts flake off and contaminate the environment
- In classic scabies the environment plays a minor role.
- Animal scabies : different parasites that may cause transient infestation (parasites die within 2 days and do not multiply). No treatment required for humans.

#### 8. Underestimated prevalence worldwide

- Not a notifiable disease
- 4.2% prevalence in a village in Spain\*
- In Lower Silesia, Poland: from 7.9 to 80 / 100,000 people from 1990 to 1997\*\*
- Increasing trends in urban areas in the UK\*\*\*
- More frequent : autumn / winter, children, young adults, women, and within families
- Frequently in patients attending STD clinics in association with other venereal diseases

\* Reid & Thorne. Epidemiol Infect 1990;105:595-602  
 \*\* Lone & Okulewicz. J Parasitol 2000;86:170-171  
 \*\*\* Downs et al. Epidemiol Infect 1999;122:471-477

#### 9. In developing countries : public - health problem

- Prevalence: 3.8% - 8.8%
- Solomon Islands & Aborigians – Australia: 25% prevalence among children\*,\*\*
- In poor populations : frequent superinfection by *Streptococcus pyogenes* or *Staphylococcus aureus*  
 ⇒ increased morbidity, occasionally fatal outcome \*,\*\*
- Superinfection is also common among patients with AIDS and homeless people.\*\*\*

\* Lawrence et al. Bull World Health Organ 2005;83:4-42  
 \*\* Carapetis et al. Pediatr Infect Dis J 1997;16:494-499  
 \*\*\* Raoult et al. Lancet Infect Dis 2001;1:77-84

#### 10. Homeless people

- Scabies frequent among them\*,\*\*
- In a study in France ( 1996 ): 56.5% ( of 189 ) homeless were infested with scabies, due to poor personal hygiene, close contact within shelters, and deficient medical attention and care.

**Physicians should consider scabies in homeless !**

\* Raoult et al. Lancet Infect Dis 2001;1:77-84  
 \*\* Badliaga et al. Eur J Dermatol 2005;15:382-386

#### 11. Residents in nursing homes

- Increased risk for crusted scabies
- Frequently treatment failure when on immunosuppressive therapy
- Onset of outbreaks within nursing homes
- In a survey of 130 chronic health - care institutions in Canada\*:
  - 20% noted cases of scabies among residents during one year
  - 11% had health - care workers infested
  - large institutions were at increased risk
  - 23% had written policies for scabies
  - 11% had written policies for mass treatment

\* Holmes et al. Arch Dermatol 1992;128:1257-1260

#### 12. Nosocomial scabies : not uncommon

In a recent review\* of 19 nosocomial outbreaks / 16 hospitals mean duration : 14.5 weeks ( range : 4 – 52 weeks )

- In all the source was an immunocompromised patient (HIV / AIDS or elderly resident in a nursing home on long - term steroid treatment )
- All admitted from the community with crusted scabies
- Most HIV / AIDS patients : initially misdiagnosed with seborrheic dermatitis or eczema
- Scabies suspected when no response to treatment

\* Vorou et al. J Hosp Infect 2007;65:9-14

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## 13. Nosocomial outbreaks (cont)

- Investigation begun when HCWs developed pruritus
- Mean number of cases / outbreak : 18 ( range : 3 – 82 )
- Mean attack rate among patients : 12.9% ( range : 4 - 40% )
- Mean number of infested HCWs : 39 ( range : 6 - 278 )
- Mean attack rate among HCWs: 34.6% ( range : 6.95 - 88% )
- All HCWs : classic scabies

## 14. Infested health - care workers

- Mainly nurses (close contact with patients, during sponge-bathing or application of lotions)
- In an outbreak in a large US hospital : risk factors for acquisition of scabies among HCWs were:
  - being a nurse or physical therapist
  - a HCW with extensive contact with patients with scabies
  - working with AIDS patients\*.

\* Obasanjo et al. Infect Control Hosp Epidemiol 2001;22:13-18

## 15. Notification of work-related diseases to the Occupational Disease Intelligence Network and the Health and Occupation Reporting network ( UK )\*

11.1% of 5,606 cases of work - related infections notified during 2000 - 2003 concerned scabies ( second only to diarrheal diseases )

\* Turner et al. Occup Med (Lond) 2005;55:275-281

## 16. Nosocomial outbreaks ( cont )

- High work load to control
- Inconvenience - difficulties for contact tracing
- Prolongation of an outbreak due to treatment failures because of resistance or re-infestation

## 17. In an outbreak that occurred in a 1,500 - bed university hospital in Brazil in 1992\*:

- From one case of crusted scabies
  - ⇒ - 22.5% of 200 laundry workers were infested
  - 8.7% of 1448 nurses
  - 10% of 270 housekeepers
  - 1.1% of lab personnel
- Total number: 278 of 1,620 HCWs from all over the hospital
- 5.31 days of absence / case
- 6,625 lost hours and \$ 50,000 total cost

\* Pasternak et al. Infect Control Hosp Epidemiol 1994;15:540-542

## 18. In a US nosocomial outbreak : 981 people were treated\*

- In a 12 - month outbreak in a VA hospital, USA \*\*:
  - 112 patients were infested in 3 waves
  - ( 2<sup>nd</sup> and 3<sup>rd</sup> waves : due to contact with an unrecognized case from the previous waves )
- Undiagnosed patients and people from the community may transmit scabies within hospitals, especially from developing countries with high prevalence rates

\* Obasanjo et al. Infect Control Hosp Epidemiol 2001;22:13-18

\*\* Jimenez-Lucho et al. Am J Infect Control 1995;23:44-49

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## 19. Factors that facilitate the onset & prolongation of scabies outbreaks within hospitals

- Scabies is not a notifiable disease
- Unknown epidemiology in developed countries
- Admission of unrecognized cases
- Increasing numbers of immunocompromised patients
- Long - incubation period

## 20. Factors that facilitate the onset & prolongation of scabies outbreaks within hospitals ( cont )

- Unfamiliarity of HCWs with atypical manifestations
- Diagnostic delay
- Therapeutic failures ( re - infestation )
- Incomplete contact tracing

## 21. Nosocomial outbreaks: increased economic burden

- Isolation – infection control measures
- Prolongation of hospitalization
- Additional medications
- Postponing selective admissions / ward closures
- Working hours for containment – contact tracing

## 22. Nosocomial outbreaks: increased economic burden ( cont )

- Costs for the containment of 2 Canadian outbreaks :  
Canadian \$ 20,000 and \$100,000
- In a Brazilian outbreak : \$50,000USD ( 1992 estimates )

\* Bannatyne et al. Can J Infect Control 1992;7:111-113

\*\* Jack M. Can J Infect Control 1993;8:11-13

\*\*\* Pasternak et al. Infect Control Hosp Epidemiol 1994;15:540-542

## 23. Clinical manifestations of scabies

### Long incubation period

- 3-4 weeks following first infestation ( up to 2 months )
- 3-4 days following re - infestation

**No immunity to scabies !!**

## 24. Classic scabies ( clinical manifestations )

- Generalized intensive pruritus, mainly during night –  
- Risk for bacterial infections
- Burrows ( pathognomonic ) : slightly elevated lines,  
on hands ( especially between fingers ), wrists,  
elbows, penis, axillae, umbilicus, buttocks, and  
nipples erythematous papules also
- Children < 1 year and immunocompromised patients : head,  
palms and soles are frequently involved , but not in older  
children and adults

Infection Control. Guidelines for Perinatal Care.  
American Academy of Pediatrics

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25. Infant with scabies



26. Burrows on the sides of the fingers



27. Burrow on the sides of the foot



28. Crusted ( Norwegian ) scabies

- Immunocompromised patients ( HIV / AIDS )\*
  - Patients on topical / systemic steroids\*\*
  - Organ - transplant recipients / leukemic patients
  - Elderly institutionalized or deliberated patients
  - Down syndrome
- \* staphylococcal sepsis in immunocompromised patients with crusted scabies ( increased mortality )
- \*\* do not always have signs and symptoms , but may transmit

29. Crusted ( Norwegian ) scabies

- Clinical manifestations
- Scaly dermatosis ( crusty appearance over the skin )
- Mild or no pruritus at all
- Occasionally generalized lymphadenopathy
- Nails and face : commonly involved
- Manifestation also as erythematous eruption
- Elderly may have nonspecific pruritic lesions attributed to "senile pruritus" / crusted scabies may develop when long - term topical steroid treatment is administered.

30. Crusted scabies. Heavy crusting between fingers



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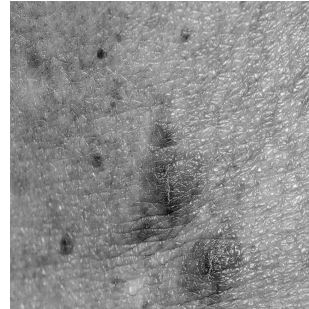
## 31. Nodular scabies

- Nodular pruritic lesions, mainly in groin / axillae / penis
- Lesions appear after prolonged infestation and usually persist for weeks or months following treatment
- Attributed to specific immunologic reaction

### Bullous scabies

- Bullous pemphigoid eruptions in patients > 65 years

## 32. Nodular scabies



## 33. Suspicion for scabies

- Compatible picture with slow-onset intense pruritus and family history
- Residence / working in a nursing home
- Cluster of non-specific pruritic cases among HCWs
- Diagnosis should not rely on pruritus only !!

34. In case of strong clinical suspicion but no laboratory confirmation, diagnosis may be established when the patient responds to appropriate treatment.

Often misdiagnosis with : eczema, atopic dermatitis, contact dermatitis, drug reaction, impetigo, urticaria, delusional parasitosis

## 35. Diagnosis

- Visualization of mites / eggs / fecal material in skin scraping from a burrow or underneath the nails  
10 - 60% sensitivity → several specimens
- Microscopy may be difficult in classic scabies due to the small number of mites.
- *In vivo* epiluminescence microscopy : rapid diagnosis, high sensitivity, patient convenience\*

**Cases of scabies may be tested negative !!**

\*Argenziano et al. Arch Dermatol 1997;133:751-753

## 36. Infection control for scabies within hospitals

Prompt recognition of a case of scabies

&

Implementation of infection control measures

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## 37. Infection control measures

### Classic scabies

- Isolation for 24h following onset of treatment
- disposable gloves during patient contact for 24h
- routine disinfection practices for room cleaning

## 38. Infection control measures for crusted scabies

- Admission in hospital for isolation and treatment (cohorting when results are known)
- Contact precautions !!
- Use of disposable gloves, long – sleeved gowns, and shoe covers ⇨ dispose before exit the room
- Restrict number of HCWs
- Treatment of HCWs following direct contact with the patient, return to work after completing treatment

## 39. Infection control for crusted scabies (cont)

- Fomites: handling only from persons wearing gloves & gowns
  - Clothes & lines used 5 days before treatment : in specific plastic bags, machine washed in hot water for  $\geq 10$ min, dried and ironed or under sun. Do not sort linens & clothes !!
  - Carpets & furniture : vacuumed with insecticide spraying (prefer vinyl instead of textile for furniture)
  - Items than cannot be washed : treatment with insecticidal powder (i.e. chloramine 5%) and stored in plastic bags for 10 days or in a freezer at -20C for 72h

## 39. Infection control for crusted scabies (cont)

- Test the patient when he becomes asymptomatic and 2 - 4 weeks following treatment completion
- Discontinue infection control measures when skin scrapings are negative for 3 consecutive days
- Persistence of symptoms : resistance to treatment, re-infestation or another diagnosis
- Concurrent treatment of family members and contacts (and sexual contacts) regardless of symptoms
- Homeless suspected with scabies should be treated.

## 41. During a nosocomial outbreak of scabies :

- Find contact cases and confirm diagnosis
- Diagnosis may rely on clinical findings alone
- Suspected cases : isolation until results are known
- Cohorting of diagnosed cases
- Postpone selective admissions
- Contacts & family members : concurrent treatment regardless of symptoms
- Provide written material to HCWs caring for patients with scabies
- Failure to coordinate these leads to failure to control the outbreak !!

## 42. Inform – educate HCWs\* about :

- Epidemiology (transmission, long incubation period)
- Clinical manifestations
- Treatment
- Infection control measures (protective equipment etc)

*\* all personnel that may be in contact with scabies (physicians, nurses, cleaners, laundry, etc)*

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## 43. Distribution of informative leaflets to patients and their contacts

- Agent
- Epidemiology ( way of transmission, long incubation period )
- Clinical manifestations
- Diagnosis
- Treatment
- Persistence of pruritus

## 44. Treatment of scabies

- Local or systemic agents
- Available local agents :
  - permethrin 5% cream \*
  - 1% lindane lotion \*\*
  - 6% precipitated sulphur \*\*\*

\* for > 2 months, experience for nosocomial outbreaks, adverse effect: contact dermatitis

\*\* major drawback : neurotoxicity, only in cases resistant to other agents, do not give in pregnant / lactating women, children and highly damaged skin

\*\*\* suitable for < 2 months old and pregnant women

## 45. Systemic treatment of scabies \*

### Ivermectin P.O.

- For crusted scabies plus local agent ( 1 - 3 doses of 200 µg/kg of ivermectin ) : 100% effective, no relapses, cost similar to other agents
- For immunocompromised patients : add keratolytic agent
- Ivermectin also for deliberated cases, institutional outbreaks, and severe lesions
- No serious adverse effects
- Not for pregnant / lactating women or young children

\* Heukelbach et al. Bull World Health Organ 2004;82:563-571

## 46. Pruritus may persist for 2 - 3 weeks following treatment !!

For itching alleviation: antihistamine agents

## 47. Systemic review of 11 randomized trials\*

- No difference in clinical cure rates or adverse effects among various treatment agents
- Permethrin preferred because of traditional reviews, and greater experience on nosocomial outbreaks

\* Walker and Johnstone. Arch Dermatol 2000;136:387-389

## 48. Conclusions

Scabies : parasitic dermatosis with worldwide distribution

Large nosocomial outbreaks with considerable morbidity among patients and HCWs, workload, and economic burden

Unrecognized cases of crusted scabies are the main source for nosocomial transmission

Factors that facilitate nosocomial transmission: poor knowledge of scabies epidemiology in developed countries, unfamiliarity of HCWs with atypical manifestations, long incubation period, diagnostic delay, and incomplete contact tracing and monitoring



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**49. Conclusions ( cont )**

**Containment of a nosocomial outbreak requires:**

- **Prompt recognition and treatment of cases**
- **Immediate implementation of infection control measures**
- **Contact tracing**
- **Simultaneous treatment of all contacts**
- **Prolonged monitoring**

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09 Oct. 08	<u>Elimination of Health Care-Associated Infections: Is it Possible &amp; Can we Afford Not to Try?</u> Speaker: Russell Olmsted, Saint Joseph Mercy Health System
20 Oct. 08	<u>(South Pacific Teleclass) Biofilms - When Bugs Get Clingy</u> Speaker: Dr. David Hammer, Canterbury District Health Board
23 Oct. 08	<u>Health Care Facility Maintenance for Infection Control</u> Speaker: Andy Streifel, University of Minnesota
30 Oct. 08	<u>LTC - How Maryland Increased ICP Presence in Long Term Care Facilities</u> Speaker: Dr. Brenda Roup, Maryland Department of Health and Mental Health
11 Nov. 08	<u>(British Teleclass) Clostridium difficile - Prevention is Better Than Cure</u> Speaker: Prof Mark Wilcox, University of Leeds

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