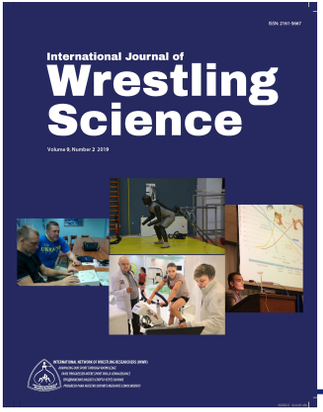

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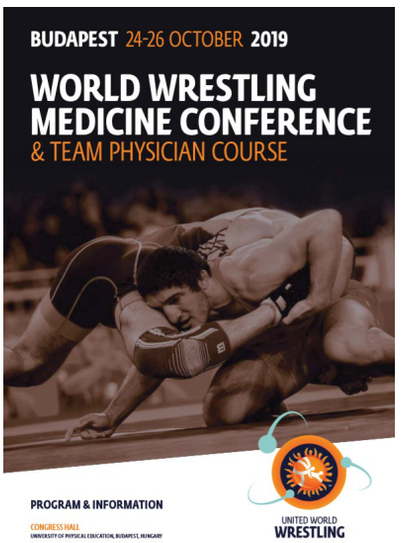

SKIN CONDITIONS IN WRESTLING – HOW TO PREVENT

Krisztián Gáspár

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SKIN CONDITIONS IN WRESTLING – HOW TO PREVENT

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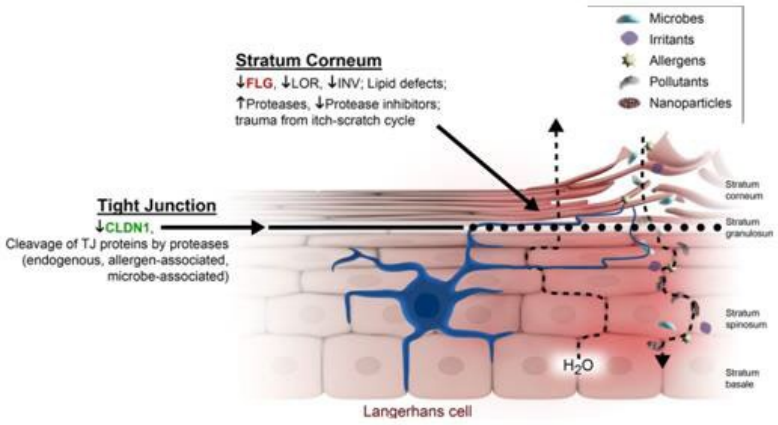
Skin Barrier
Danger model:
"The basic function of immune system is not to distinct between self and non-self, but to recognize danger."

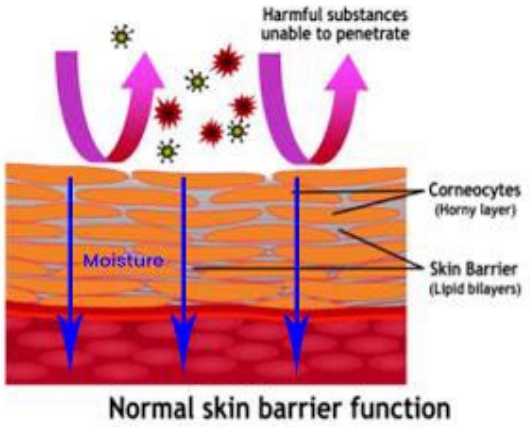
In order to avoid or prevent a loss on the mat you need a good defense –The same is true for skin (an active defense)
Polly Matzinger, PhD, Immunologist, NIH

Skin barrier functions
Physicochemical barrier and immunological barrier – in close morphological and functional connection.
Physicochemical barrier Stratum corneum: corneocytes
- Stratum granulosum: keratinocytes
- Cornified envelop, structural proteins (filaggrin)
- Lipid layer, proteases, protease inhibitors, defensins
- Tight junctions, corneodesmosomes

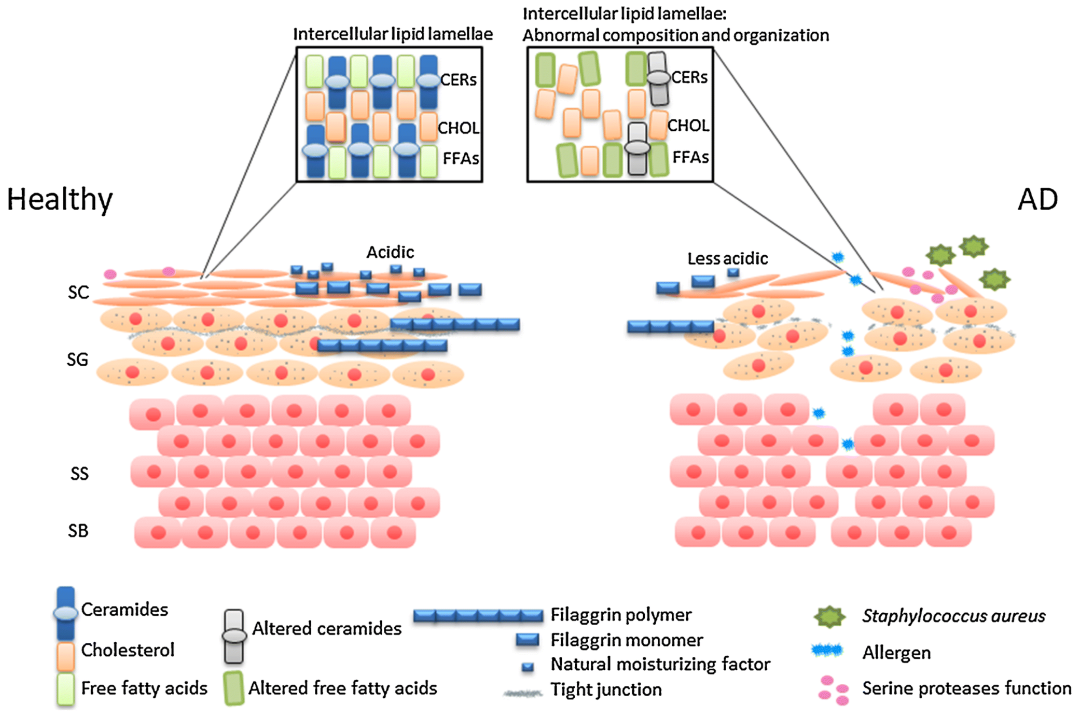
Immunological barrier (SIS)
- Epidermis, dermis
- Keratinocytes, dendritic cells, T cells
- Defensins, cytokines, chemokines



Physicochemical barrier
Genetics
Environmental factors
- microbes (viruses, fungi, bacteria, parasites)
- physical factors (e.g. UV, humidity, scratching)
- chemicals (e.g. irritants)
- biological factors (allergens)



Elements of intact and impaired physicochemical barrier in the case of Atopic Dermatitis



Atopic Dermatitis

- Chronic, non-contagious inflammatory skin disease.
- Dry skin, pruritus, possible superinfections (>90% S. aureus colonization).
- Prevalence in Europe in children 15-25%, in adults 2-10%, continuously increasing.

Possible Prevention Techniques

- Avoidance mechanisms (specific and non-specific triggers, provocation factors) (?)
- Diet, probiotics
- Continuous emollient use
  - Complex treatment in AD is unavoidable and inevitable in both acute and chronic form of disease.
  - Helps in rehydration of skin, decreasing skin dryness.
  - Replaces essential fatty acids locally.
  - Increases skin elasticity. Decreases tension and itch of skin. Cleaning effect.
  - Daily min. 2x in case of symptoms and 1x daily for preventive reasons
  - Whole body use

Emollient therapy in AD

Emollients right after shower (~5 min; ~27 Celsius), after gentle drying (skin still moist).

- Long effect even without shower.
- Allergens in emollients must be avoided to prevent sensitization via skin.
- By its water-binding elements (e.g. urea, glycerol, hyaluronic acid) it hydrates stratum corneum
- Occlusive characters (lipid, fat, oil contain) TEWL decreases
- Further effects: changes microbiome and pH; increases AMP level; FLG and loricrin expression
- increases; T cell and DC infiltration decreases; antifungal, anti-pruritic, anti-inflammatory effects

Skin diseases in wrestling

- •Trauma
- •Eczema (contact dermatitis)
- •Infection (fungal, bacterial, viral, parasitic

Contact dermatitis

- Heterogeneous group
- Noninfectious inflammatory dermatoses in which the pathological changes in the epidermis and the upper dermis produce distinctive clinical pictures
- Extremely common, 15-25% of patients with skin diseases
- Occupational dermatosis (No1)

Treatments in general

- Conventional medicine must be recommended and prescribed by physicians or health care professionals.
- Wrestlers not reporting a skin condition/infection and using unusual and unhealthy treatments (e.g. nail polish remover, bleach, salt, vinegar solutions) are causing unwanted adverse events (e.g. suffocate or burn an infection, leaving extensive scars).
- ”Home remedies” – may be successful, but do not guarantee to kill the infection (only eliminating visible symptoms temporarily). Thus, infections may not be symptomatic, but still remain transmittable.
    - **D**efine etiology, classification
    - **E**liminate provoking factors
    - **R**estore epidermal barrier function
    - **M**oisturize
    - **A**nti-inflammatories, immunosuppression (topical corticosteroids, topical calcineurin inhibitors)

  Acronym: DERMA (skin)

SKIN INFECTIONS IN WRESTLING

10% of time-loss injuries in wrestling are due to skin infections

- **Fungal**
- **Bacterial**
- **Viral**
- **Parasitic**

By National Collegiate Athletic Association's (NCAA) Injury Surveillance System

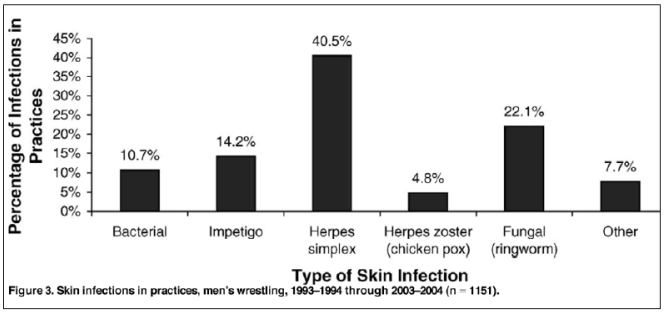


Figure 3. Skin infections in practices, men's wrestling, 1993–1994 through 2003–2004 (n = 1151).

- Overall skin infection rate 14/10000
- 22% recurrence rate
- Rate for viral infections was 1.7x the rate of bacterial and 2.1x the rate of fungal infections

CAA GUIDELINE 2j Skin Infections in Athletics 2008

Herzog MM et al *J Athletic Training* 2017; 52:457-63.

Fungal

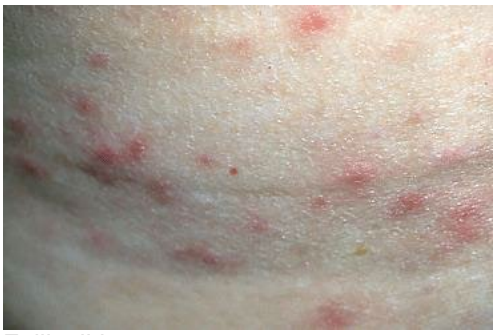
- Direct contact
- Indirect sources (mats, headgear, towel, uniform)
- In scalp may get deeper lesions
- Tinea corporis gladiatorum;
- Athletes foot; jock itch; ringworm

Treatment

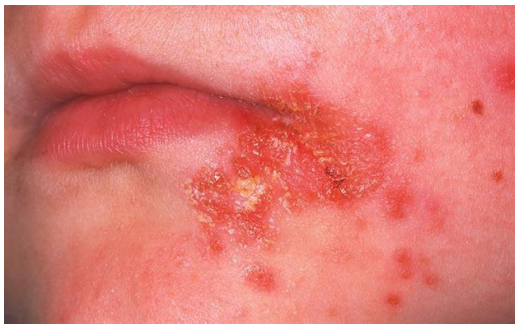
- Topical – cream, ointment
  Once a day; Do not cover;
  7-10 days
- Systemic – tablets, capsules
    - Extent forms of disease
    - Scalp involvement
    - Until total clearance (weeks)
- Combination
- In recurrent cases antifungal prevention may be possible

Bacterial

- Folliculitis, impetigo, erysipelas, cellulitis
- Streptococcus pyogenes; Staphylococcus, aureus; Pseudomonas
- Contagious (crust covered erosions)
- Itch
- Direct contact
- Predisposing factors (shaving, haircut, eczema), primary sites (head, extremities)



Folliculitis



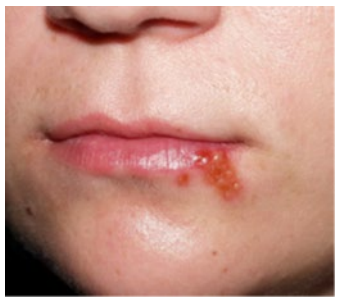
Impetigo

Treatment

- Topical – cream, ointment
  - Topical antibiotics, disinfectants
  - Once a day;
  - Remove crust;
  - Cover;
  - 7-10 days
- Systemic – tablets, capsules
  - Antibiotics (in prevention not possible – resistance)
  - Extent forms or systemic symptoms
  - 7-10 days
- Combination

Community Associated Methicillin Resistant Staph. Aureus (CA-MRSA)

- Looks identical to other forms of S. aureus, but different strains. Irresponsive to regular antibiotics (e.g. Penicillin), but not multidrug-resistant
- Seen in community; believed due to antibiotic abuse/overuse for ear infection or viral infections
- Very invasive and destructive to skin and soft tissue
- Can spread to the lungs causing serious pneumonia
- Can only be diagnosed by culturing an infection
- When it occurs, usually seen as an abscess or boil (59%) vs cellulitis (42%) or folliculitis (7%)
- Primarily seen in contact sports (wrestling, rugby)
- Clindamycin (4x300mg) for 10 days; incision and drainage



Viral – herpes

- Latent virus (cluster)
- Contagious (30% chance to contract)
- (vesicles, open sores, early crusts)
- HSV-1, HSV-2
- Painful
- Lips, body, genitals
- Recurrence (stress, immunocompromised)
- Secondary bacterial superinfection

Herpes gladiatorum

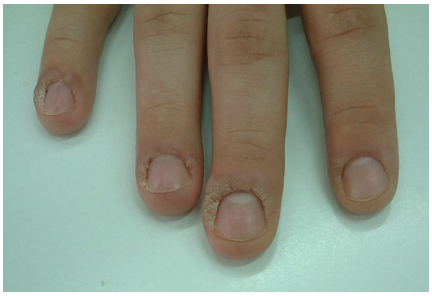
- Prevalence: 3-20% (varies in age groups)
- Primary outbreak: malaise, pharyngitis, fever, lymphadenopathy
- Primarily at ”lock-up” position: 70% head and face; 40% extremities; 30% trunk
- Skin-to-skin contact
- 3-8 days after contact, lasts for about 10 days
- All wrestlers in contact with it, should be isolated and monitored for 8 days. If no lesions develop, return to competition

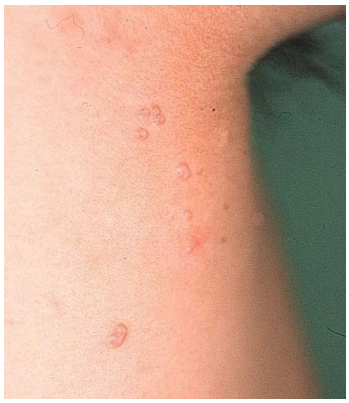
Treatment

- Topical – cream, ointment
  - Not so effective
- Systemic – Acute
  - Start within 3 days
  - Acyclovir 5x200mg for 7-10 days (even longer)
- Systemic – Recurrence

        - Min 3x in 6 months
        - Acyclovir 2-3x200mg or 2x400mg for 6 months
    - Preventative antiviral medication may be possible starting five days before the season and continuing throughout the season. Prophylactic valacyclovir (QD 1g) for 1M in wrestlers resulted in 85% decrease in the probability and 90% decrease in the incidence of outbreak.

Viral – wart, molluscum





- HPV; Pox virus
- Direct contact
- Contagious until removed

Treatment

- Topical – exfoliative
  - Salicylic acid
- Topical – cytostatic
  - Podophyllum
- Topical – immunomodulatory
  - Imiquimod
- Surgical
  - Liquid nitrogen
  - Electrosurgery
  - Curettage
  - Laser (ablative)
  -

Parasitic –scabies, lice

- Direct contact
- Intense pruritus
- Predilection areas (neck, hands, genitals)
- Contagious until treated (STI!)
- Eczema remains
- Possible superinfection
- Benzyl benzoate; Permethrin
- Appropriate treatment (3-5-14 days depending on the disease)
- No new lesions present (for 2-3 days)
- Proper bandage (cover)

Preventions in skin infections

- Utilize recommended procedures for cleaning and disinfection of surfaces. Clean workout gear, clothes, towels for each practice. Mats must be cleaned before each practice with appropriate disinfectant.
- Regular skin check (performed every day before practices) (visual enough no palpation necessary)
- Improve wrestlers' hygiene practices
- Shave your face only (otherwise opportunity for infection)
- Wrestlers must shower immediately after practice (nearly 10% do not!)
- Coaches and trainers must be educated on skin infections

Skin examination and rules

- At wrestling meets, skin must be checked by medical experts or trained referees.
- Any skin condition must be stated non-infectious, adequately medicated and covered with bandage.
- Wrestlers must have developed no new lesions 72 hours prior to examination.
- Open wounds and infectious skin conditions that cannot be adequately protected are considered grounds for disqualification (from both practice and competition).
- Wrestlers undergoing treatment must provide written documentation from a physician (diagnosis; culture results - if possible; date therapy began; names of medications.

Conclusion – Take home message

- Skin infections may be significant problems in wrestling
- Look after your environment (clean equipment)! Protect yourself of harm/danger (danger model)!
- Keep the barrier intact! Prevention by moisturizing
- Prompt and proper diagnosis by specialist dermatologist inevitable in case of dermatological disorders
- Isolation and observation of individual
- Targeted treatment if necessary (avoid "home remedies")
- Importance of withdrawal of wrestler's permission from competition