Xerosis and Pruritus in the Elderly

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Xerosis and Pruritus
(Dry Skin And Itching)

Abstract

Xerosis (dry skin) is a common dermatological skin condition. Dry Skin, or Xerotic Eczema, can be labeled as Xerosis, Eczema craquele, Dyshidrotic Eczema, or Asteatotic Eczema.

Xerosis

Incidence has increased in recent years because of:
• more frequent bathing and showering
• fragranced baths

Xerosis

The condition is characterized by pruritic, dry, cracked and fissured skin with scaling.

Xerosis occurs most often on the legs of elderly patients.

These skin cracks or fissures are present from epidermal water loss.
**Signs/Symptoms:**

The skin splits and cracks deeply enough to disrupt dermal capillaries and bleeding fissures may occur. Itching or pruritis occurs leading to secondary lesions. Scratching and rubbing activities produce excoriations, an inflammatory response, lichen simplex chronicus and even edematous patches.

**Differential diagnosis:** stasis dermatitis

**Treatment—**Moisturizers, alpha-hydroxy
Avoidance of harsh skin cleansers

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**Xerosis**

It is characterized as
- pruritic (itchy)
- dry
- cracked
- fissured

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**Xerosis**

Xerosis has a spectrum of clinical findings

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**Scanning electron micrograph of the stratum corneum**

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**Scanning electron micrograph of the stratum corneum**

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**Scanning electron micrograph of the stratum corneum**

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Ichthyosis

- Ichthyosis is derived from the Greek word *ichthys* which means “fish”
- Describes a group of diseases characterized by abnormal differentiation of the epidermis
- Manifests clinically as scaling of the skin
- Can be inherited or acquired

Xerosis

Classified as:
- Acquired
- Congenital

Causes of Xerosis

- **Endogenous Causes**
  - Asteatotic eczema
  - Venous dermatitis
  - Atopic dermatitis
  - Aging
  - Hereditary conditions (i.e. Ichthyosis)
  - Acquired conditions

- **Exogenous causes**
  - Excessive exposure to water, dry climate, detergents

Causes of Xerosis

Environmental agents that lead to xerosis include:
- Hot water
- Soap & detergents
- Friction from clothing
- Frequent air travel
- Pollution
- Other chemicals
- Air conditioning
- Low humidity
- Seasonal changes

Stasis dermatitis
Stasis dermatitis

Management: includes topical agents such as Alpha-Hydroxy acid moisturizers or steroid cream or ointment (triamcinolone for 10-14 days).

Stasis Ulcers

The stratum corneum of the skin is surrounded by a lipid bilayer composed primarily of ceramides, fatty acids, and cholesterol.

When these constituents are present in the proper proportion, they form the “skin barrier,” which functions like a brick wall (keratinocytes) covered by mortar (the lipid bilayer). This barrier protects the skin and keeps it watertight.

Defects in the stratum corneum or barrier can result in transepidermal water loss, which dehydrates the skin and imparts a dry appearance.

An impaired barrier may also make skin more susceptible to damage from exogenous sources such as plants, chemicals, and even water.

Ceramides (Cer)

Cer is an amide-linked fatty acid containing a long-chain amino alcohol. This amino alcohol is named as sphingoid base or sphingol. Cer is the backbone of all sphingolipids.

Frequent eruptions of erythema and pruritus typify dry, sensitive skin and indicate a likely defect in the stratum corneum. People with such skin are at higher-than-average risk for eczema.

Natural moisturizing factor (NMF), a substance that retains water inside keratinocytes and renders them plump, also plays an important role in the pathophysiology of dry skin.

Natural moisturizing factor (NMF) is derived from the hydrolysis of the protein filaggrin, which confers structural support to the dermal layers and breaks down as NMF in the epidermal layers, exhibiting a strong capacity to bind water and hold it inside the cell.

NMF is derived from the hydrolysis of the protein filaggrin, which confers structural support to the dermal layers and breaks down as NMF in the epidermal layers, exhibiting a strong capacity to bind water and hold it inside the cell.

Currently, there is no known method of artificially enhancing filaggrin breakdown in order to elevate NMF levels. In the 1970s, UV light was demonstrated to disrupt the enzymatic hydrolysis of filaggrin to NMF, suggesting that reduction of sun exposure might improve skin dryness.

The breakdown of filaggrin acclimates to varying environmental conditions over a course of several days. In a low-humidity environment, more NMF is produced.
Causes of Xerosis

Xerosis is due in part to:
- Decrease in the natural moisturizing factor in stratum corneum
- Defect in permeability barrier

The reduced production of sebum also may play a role in dry skin. Sebum contains wax esters, triglycerides, and squalene, all of which protect the skin from the environment. (Clinics Dermatol. 1995;13:307–21).

Sebum-derived fats form lipid films on the skin surface that help to prevent water loss. However, low sebaceous gland activity is not correlated with xerosis.

Not all people with xerosis have decreased sebum production, which is affected by diet, heredity, stress, and hormones. (Br. J. Dermatol. 1988;118:393–6).

The influence of sebum on dry skin is not well understood

A deficiency of NMF and low sebum levels may cause dry skin and may increase skin sensitivity. (J. Invest. Dermatol. 1987;88:2s–6s).

Hyaluronic acid (HA), which can bind 1,000 times its weight in water, also helps retain water in the skin. Aged skin is characterized by reduced HA levels, which causes dryness and makes the skin appear older and less plump.

Glucoasamine supplements may help increase HA production, although HA does not penetrate the skin when applied topically. (Cosm. Toil. 1998;113:35–42).

Diet

Replenishing the three key components of the stratum corneum—ceramides, fatty acids, and cholesterol—is the aim of some skin care formulations.

Diet also plays an important role in maintaining a healthy skin barrier; fatty acids and cholesterol are derived from the diet. Certain individuals receiving cholesterol-reducing drugs exhibit dry skin.
The addition of evening primrose oil, borage oil, or omega fatty acids to the diet may contribute to ameliorating dry, sensitive skin by replenishing essential components of the stratum corneum.

**Hydration**

- Water helps maintain a healthy stratum corneum
- Water increases the permeability of the skin
  - Mechanism is not known
  - Relationship between permeability and overhydration is not known

**Therapy**

- Adequate hydration
- Avoid foaming detergents and soap found in laundry cleansers, body cleansers, and face cleansers
- Avoid prolonged baths, particularly in hot or chlorinated water.
- Use humidifiers in low-humidity environments
- Consider taking omega-3 fatty acid supplements
- Moisturize two or three times daily.

**Skin Assessment: Xerosis (Dry Skin)**

Coloplast Skin Health Division developed the following Xerosis Assessment Tool to be utilized when assessing and documenting patient skin conditions. It is derived from documented clinical studies assessing xerosis and review of clinical literature.

The purpose of this tool is to provide clinicians with a tool to assess, document and establish interventions for xerotic (dry) skin before the patient develops scratching and/or develops skin complications.

**What is Pruritus?**

- Pruritis or itch is a common complaint
- Can be due to many dermatological and medical illnesses
- Can occur with or without skin lesions

**Xerosis Assessment Tool**

**Xerosis Scale for Measuring Dry, Scaly Skin**

- 0: Absent
- 1: Mild dry skin with minimal flaking
- 2: Moderate dry skin with flaking
- 3: Severe dry skin with or without cracking/fissures

Skin health interventions for xerosis includes appropriate bathing and moisturization strategies to minimize the likelihood of a break in skin integrity. Developing an individualized plan of care for the patient with xerosis is essential in restoring skin health and greatly improving patient outcomes.
Pruritus

- Also known as “itch”
- Dominant symptom of many skin diseases
- May be the initial sign of many systemic diseases
- Originates in the skin or in the central nervous system
- Transmitted by unmyelinated C nerve fibers
- Elicited by physical and chemical stimuli
- The receptor for pruritic stimuli are located in the epidermis

Mediators of Pruritus

- Inflamed skin causes the release of a number of chemicals (histamine, prostaglandin, substance P, interleukins, tryptase, serotonin, and opioid peptides) which mediate pruritus
- Pruritus in skin disease is multifactorial; neurogenic components may play a role in some skin diseases

Evaluation of Pruritus

- Examination of the skin
- Assessment
  - primary and secondary lesions
  - morphology and distribution
  - presence of lichenification

Table 7.1 Descriptive and historical features of pruritus

<table>
<thead>
<tr>
<th>Descriptive features of pruritus</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>itchy, scratching, burning, pruritic</td>
</tr>
<tr>
<td>Time course</td>
<td>Chronic, intermittent, cyclical, puffy</td>
</tr>
<tr>
<td>Extent</td>
<td>Diffuse, severe, mild</td>
</tr>
<tr>
<td>Intensity</td>
<td>Intermittent, constant, intermittent</td>
</tr>
<tr>
<td>Relationship to activities</td>
<td>Pruritic sensation or itching of skin</td>
</tr>
<tr>
<td>Patient’s personal theory as to etiology of disease</td>
<td></td>
</tr>
<tr>
<td>Historical features of pruritus</td>
<td></td>
</tr>
</tbody>
</table>
  - Mediators including topical agents: prescribed, over-the-counter, thc, addiction and onset |
  - Allergic contact, allergic allergic, dermatitis, and hives |
  - Past medical history: thyroid, allergy or renal dysfunction, other systemic diseases |
  - Family history of atopic or skin disease or similar pruritic conditions |
  - Onychomycosis |
  - Problems with personal hygiene, household pets, and personal contact, food, allergic, insect bites |
  - Drugs: antihistamines, alcohol, intravenous drugs |
  - Pet and their care |
  - Social history |
  - Personal history |
  - Prior diagnosis made by physician or patient |

Evaluation of Pruritus

Patients with severe pruritus that does not respond to conservative therapy should be evaluated for

- metabolic or endocrine disorders
  - Diabetes mellitus
  - Renal failure
  - Thyroid disease
  - Cushing’s disease (obstructive)
- malignant neoplasm
  - Lymphomas
- hematologic disease
  - Polycythemia vera
- human immunodeficiency virus infection
- complication of pharmacologic therapy
- neuropsychiatric diseases

lymphoma
Evaluation of Pruritus

Possible diagnostic tests to be performed

- complete blood count with differential and platelets
- thyroid-stimulating hormone
- serum bilirubin, liver transaminases, alkaline phosphatase
- fasting glucose
- serum creatinine and blood urea nitrogen levels
- chest radiography
- HIV
The "itch-scratch" cycle is the dermatologic equivalent of chronic pain syndrome, and should be treated as such. Just as with chronic pain, there is a "reduced threshold" phenomenon that occurs in patients with chronic itch. Chronicity not only lowers the threshold for the sensation of itch, it also increases the intensity of itch. Also, as with chronic pain, short bursts of spontaneous itch may occur, even when the skin is clear.

### Treatment of Pruritus

**General measures include**
- Elimination of factors that aggravate dry skin
- Patient education
- Teaching of adequate methods of interrupting the itch-scratch cycle

### Prevention and Treatment of Pruritus

- **DOs**
  - Wear cotton or silk clothing
  - Take short, lukewarm baths/showers
  - Dry gently after bathing
  - Apply topical emollients immediately after bathing
  - Keep nails short
  - Stop the Itch-Scratch cycle
**Prevention and Treatment of Pruritus**

- **DON'Ts**
  - Wear wool or synthetic clothing
  - Take long, hot showers/baths
  - Live in cold, dry climates
  - Use soaps excessively
  - Scrub habitually
  - Have prolonged exposure to water
  - Scratch

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**Treatment of Pruritus**

- Teaching of adequate methods of interrupting the itch-scratch cycle
  - Application of a cold washcloth
  - Gentle pressure

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**Treatment of Pruritus**

Multiple topical and systemic treatments have been recommended for the management of pruritus, as well other modalities.

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**Treatment of Pruritus**

- **Topical agents**
  - emollients
  - corticosteroids
  - anesthetics
  - doxepin
  - capsaicin
  - menthol
  - topical immunomodulators

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**Treatment of Pruritus**

- **Systemic agents**
  - hydroxyzine hydrochloride
  - diphenhydramine
  - doxepin (tricyclic antidepressant with antihistaminic properties)
  - oral corticosteroids

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New t-shirt to prevent itching in children and adults.

--to be sold by Hill Pharmaceutical based on a fabric developed by Milliken.

--It has an extremely low coefficient of friction and wicks sweat better than cotton.

--Close-up pictures of cotton vs. this microfiber long filament polyester.

--"We were able to show a statistically significant reduction in itching between cotton and this fabric in 60 subjects in a 4 week cross over study"

From Dr. Zoe Draelos
Inflammatory which time prints on the visage of the high and low alike."

The food service personnel would be cooking for your stays. Think about it. What happens if you were in a situation where you are now put into a facility such as a nursing home? The nurses and aides would help you get out of bed in the morning, toilet, bath, and feed you your meals. Why the shortage of high quality skin care? Not enough attention is given to skin problems and treatment in long-term care. Nurses and medical directors have a responsibility to recognize and treat dermatologic conditions. Patients often have a need to talk and for social contact. It is important to communicate with the patient's family about their problems and concerns. The social services staff would try to help solve the patient's problems. Delay in care and treatment often occurs. Other problems include little access to specialists and the cost containment of medical directors and consultants decision-making. All of these principles and issues must be addressed in the spotlight of cost containment and litigation. The staff require CEUs and are generally very appreciative of your time. You may get applied at least once a day. Conditions in the long-term care patient. If you prescribe Triamcinolone cream 0.1% for intertrigo, be sure to specify how often it should be applied. Keep in mind the ten tips:

1. Whenever possible, identify the reason for each prescribed medication and treatment.
2. At least once a year, provide in-services to the nursing home staff on dermatology.
3. Assume the treatment will not be provided as often as prescribed. Workload, time, and the realm of both dermatology and geriatrics.

References

3. Young EM, Newcomer VD, Kligman AM. Skin Disease in Old Age Martin Dunitz 1999
4. Marks R Skin Disease in Old Age Martin Dunitz London 1999

Figure 1

Figure 2

Dermatology Consultations in the Nursing Home—A Ten Year Retrospective

On-Board a Nursing Home: A Tour in the Realm of Geriatric Dermatology

Table:

<table>
<thead>
<tr>
<th>Code</th>
<th>ICD-9-CM</th>
<th>% Male</th>
<th>Mean Age (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>1000</td>
<td>40</td>
<td>65.5</td>
</tr>
<tr>
<td>73</td>
<td>900</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>74</td>
<td>800</td>
<td>20</td>
<td>75</td>
</tr>
</tbody>
</table>

- Pruritus and other related diseases
- Eczematous of the sebaceous glands (Xerosis=772)
- Other dermatoses
- Basal or squamous cell carcinoma of the skin
- Scabies
- Contact dermatitis and other eczema