COMFORTABLE IN MY SKIN
Dermatologic Issues in Down Syndrome

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DISCLOSURE
No one involved in the planning or presentation of this activity has any relevant financial relationships with a commercial interest to disclose.

LEARNING OBJECTIVES

• Identify common dermatologic issues in patients with Down syndrome
• Explain treatment modalities of common dermatologic issues occurring in patients with Down syndrome
• Differentiate which dermatologic issues warrant referral to a pediatric dermatologist

OVERVIEW

• Dermatologic issues are very common in children with Down syndrome
• Some common conditions should be recognized and treated in the primary care settings.
• Other conditions require a higher level of care by a dermatologist
• With this talk, we hope to empower providers to comfortably recognize and treat common skin conditions that occur in patients with Down syndrome
CUTANEOUS FEATURES IN DS

- A variety of dermatological disorders are more common in Down syndrome
- A single transverse palmar crease is the most common cutaneous finding
  - Unilateral in 4% and bilateral in 1% of the general population.
  - Transient physiological cutaneous manifestations are common during infancy
  - Chronic skin conditions appear later on in life

PREDISPOSING FACTORS

HYPOTONIA

- More likely to stay in one position
  - Neck fold, armpit fold, inguinal fold can be chronically exposed to moisture
  - More time lying on their back -> bald spots
- Low oromotor tone
- Drooling
- Poor coordination while feeding
  - Skin often in contact with milk/food
- Delayed achievement of continence
  - Diapered for an extended period of time

PREDISPOSING FACTORS: PREMATURE AGEING

- Premature onset of age dependent changes
  - Hair graying, thinning
  - Wrinkling
- Could be related to lower basal levels of DNA repair enzymes
  - Decreased capacity to repair UV-induced DNA damage
- Could be due to overproduction of oxygen free radicals
  - Superoxide dismutase is on chromosome 21
  - Oxidative stress has been linked to T cell-mediated skin diseases like psoriasis, contact dermatitis, seborrheic dermatitis, and atopic dermatitis

PREDISPOSING FACTORS: IMMUNE DYSFUNCTION

- Abnormal antibody-mediated and cell-mediated immunity
- Reduced in vitro killing of Candida Albicans
- Reduced in vitro killing of Staph Aureus
- Increased prevalence of zinc deficiency
  - May have an effect on immune system and DNA repair enzymes
PREDISPOSING FACTORS: INCREASED RISK OF AUTOIMMUNITY

- Some autoimmune diseases can have dermatologic manifestations
  - Thyroid disease
  - Celiac
  - Autoimmune hepatitis
- Some autoimmune diseases directly affect the skin
  - Vitiligo
  - Alopecia Areata
  - Psoriasis

VASCULAR LESIONS

- Cutis marmorata: Lacy mottled red to purple skin common during early infancy due to altered blood flow in the small blood vessels of the skin.
- Livedo reticularis: Similar but less marked than cutis marmorata (more pink).
  - Does not appear to be associate with vasculitis
  - Both more prominent in cold temperatures.
- Vascular malformations (Refer)
- Increased incidence of anal atresia -> Look for PELVIS/SACRAL syndrome
  - PELVIS syndrome: the association of a perineal hemangioma with any of the following: external genital malformations, lipomyelomeningocele, vesicorenal abnormalities, imperforate anus, or skin tag.
  - SACRAL syndrome: spinal dysraphism with anogenital, cutaneous, renal, and urologic anomalies, associated with an angiomatous localization.

TMD, CONGENITAL LEUKEMIA

- Infants with DS have increased risk of leukemic reaction, transient myeloproliferative disorder and congenital leukemia.
- Congenital leukemia associated with leukemia cuts
  - Blue, firm, indurated papules and nodules
- Leukemoid reaction, transient myeloproliferative disorder associated with vasculitis
  - Crusting vesicle and pustules that appear in the first few days.
  - Generally on the face, upper body.
  - Lesions disappear spontaneously.
  - Color: red, crops, ulcers, congenital candidiasis, erythema toxicum, neonatorum, alopeic alopecia, urticaria, urticarial purpura, melanosis, seborrheic, pustular folliculitis.

ATOPIC DERMATITIS

- Xerotic cuts: is very common in children with Down syndrome
  - Predisposes to irritant contact dermatitis and allergic contact dermatitis.
  - Gentle skin care should be emphasized starting in the newborn period.
  - A skin care routine can provide needed sensory input.
- Atopic dermatitis is also common [1%]
  - Red, scaly, and itchy patches/plaques.
  - They generally involve the cheeks, behind the ears, knees and elbow flexures.
  - Can be harder to treat.
  - Often associated with lichenification and impetigo.
  - Alopecia areata is commonly seen in Down syndrome.
  - Treatment: gentle skin care, topical steroids, managing staph colonization.
  - Don’t refer unless complicated/refractory.
**CUTANEOUS INFECTIONS**

Folliculitis, furuncles, abscesses and secondary impetigo in atopic individuals

- Schepis et al (2002) found folliculitis to be the most common dermatological manifestation in their study population.
- Bacterial folliculitis common in gluteal and perianal region
- Pityrosporum folliculitis affecting the presternal and infrascapular region in 50% of men with DS 20-40 y/o

**Treatment of folliculitis:**
- Bacterial: Eradication, topical antiseptics, topical clindamycin gel
- Pityrosporum: Topical ketoconazole, may need oral treatment (ex single 150 mg dose of fluconazole, may repeat in 1 week)

*Don’t refer unless complicated/refractory*

**SEBORRHEIC DERMATITIS**

- Carter and Jegasothy (1976): 36% prevalence of seb derm in DS
- Strong association with pityrosporum folliculitis

**Presents as an erythematous rash with yellow-brown scales involving the scalp, midfacial “T” region, behind the ears, upper chest and back.**

**Treatment:**
- Babies: mineral oil, comb. May use hydrocortisone
- Older children: ketoconazole 2% shampoo

*Don’t refer unless hard to treat -> then it may be psoriasis*

**KERATODERMATOSES**

**Keratosis pilaris**

- Well-known association with DS (15% in one study)
- Hair follicles plugged with dead skin cells
- Treatment: Non-soap cleanser, exfoliation, moisturizing cream containing urea, salicylic acid

**Palmoplantar hyperkeratosis**

- Well-defined hyperkeratotic plaques were symmetrically distributed at pressure points on the palms and soles
- Ercis et al – high prevalence (43.8%)
- Treatment: Emollients, keratolytic agents, topical retinoids, topical vitamin D ointment (calcipotriol)

*Don’t refer unless complicated/refractory*

**PERIORIFICIAL DERMATITIS**

**Periorificial papules and pustules**

- Can spread to become more confluent
- On the spectrum of rosacea – can wax and wane
- Predisposing factors: steroids!

**Treatment:**
- Metronidazole or clinda topical
- Systemic doxy (acne dosing) x 2 weeks or azithro (pneumonia dosing) if severe

*Refer if fails first line treatment*
MILIA-LIKE CALCINOSIS CUTIS
- Small, discrete, white papules resembling milia, but have firm consistency and chalky appearance.
- Usually asymptomatic
- Most common on the hands and feet.
- Pathogenesis unclear.
- Higher concentrations of calcium in sweat have been found in DS, which may lead to sweat duct calcification.
- No treatment necessary. If painful, can be curetted.

Syringomas
- Small (0.5-3 mm) flesh-colored or yellow-brown dermal papules.
- The incidence of syringomas in DS has been reported to be approximately 30 times greater than in the general population.
- Syringomas of the eyelids are almost exclusive to DS patients.
- Butterworth et al (1964): female predominance
- Association with milia-like calcinosis cutis
- Not easy to treat
- Therapeutic options include electrocoagulation or cryotherapy

VITILIGO
- Depigmented areas, generally well demarcated.
- Estimated prevalence of 2% (vs 1% in the general population).
- Associated with hypothyroidism, alopecia areata.
- Will light up brightly under Woods light.
- Treatment:
  - Generally difficult to treat
  - Topical steroids + add topical tacrolimus (0.1% ointment), focusing on the face & light therapy (especially if disabling and if on the face).

ALOPECIA AREATA
- Prevalence 0.13-8.9%, with possible female predominance.
- MxA, the product of the MX1 gene, is an interferon-inducible protein, which is strongly expressed in lesional anagen hair-bulbs from patients with alopecia areata but not in normal follicles.
- Association of a marker within the MX1 gene with increased susceptibility to AA.
- The MX1 gene maps to the distal part of the DS critical region.
- Associated with vitiligo, thyroiditis, hypothyroidism and trachonychia.
- AA in patients with DS tends to be more severe.
- Treatment: Fluocinonide or triamcinolone 0.1 qhs and refer.

Refer to dermatology
ACANTHOSIS NIGRACANS
- Starts as flat hyperpigmentation, then becomes velvety
- Associated with insulin resistance
- Higher prevalence of Diabetes mellitus in DS than in the general population
  - Both type I and type II
- High prevalence of overweight and obesity
  - There may be a different distribution of body fat, more truncal than peripheral
- Soo Seo, D et al. 2018: an extra copy of DSCR1-4 results in dysregulated hepatic glucose homeostasis and pyruvate intolerance

HIDRADENITIS SUPPURATIVA
- Inflammatory pustules, nodules and abscesses in the armpits and groins
- Can lead to fistulous tract
- Interplay between bacterial colonization and inflammatory responsive
- Giovanardi et al (2018): Prevalence in DS population 3.5% (vs 0.1% general population, Garg et al 2017)
  - Younger age of onset
  - Treatment: weight loss, topical cleansers, topical clindamycin
  - Systemic doxy, clindamycin + rifampin + clinda
  - Adalimumab

PSORIASIS
- Chronic inflammatory skin condition characterized by clearly defined, red and scaly plaques
  - Look for it in the scalp as well
- Incidence is 0.5–8% in DS population (vs 1-3% in general population)
- Comorbid with obesity, gets better with weight loss
- Ddx: seborrheic dermatitis, crusted scabies, elastosis perforans serpiginosa, eczema, linea corporis

ORAL MANIFESTATIONS
- Macroglossia, fissured tongue and geographical tongue occur in up to 80% of patients.
  - No treatment necessary
- Scully et al found lip fissures in 27% and angular chelitis in 23% of 77 patients with DS compared with 0.6% in the general population.
  - Treatment: clotrimazole first, then add a little hydrocortisone on top, do twice a day for 2 weeks

Don’t refer to dermatology, but maybe to nutrition, endo

Don’t refer unless chelitis develops granuloma
INSTITUTIONALIZATION + DERMATOLOGY

Onychomycosis

- Higher frequency of onychomycosis in DS patients
- Studies report exceedingly high rates because they usually analyze cohorts of institutionalized patients (poor hygiene conditions and communal living)
- Velthuis and Nijenhuis: terbinafine an effective treatment, with a mycological cure rate of 94% in 32 patients with DS with onychomycosis
- Don't refer unless recalcitrant to treatment and bothersome to the patient

Scabies:

- Outbreaks common in institutional settings
- Patients with DS seem predisposed to crusted (Norwegian) scabies
- Poor cutaneous sensation → increased infestation rates
- Don't refer unless recalcitrant to treatment. Call derm for advice before sending: very contagious!

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