



# A Guide to Skin Conditions in Older People

The dermatoses associated with ageing can, at times, be severely debilitating. It is important to be aware of the more common presentations so that early intervention can begin.

Ageing is accompanied by changes in all organs, including the skin. This naturally occurring atrophy and fragility of the skin is accelerated by chronic environmental insults, such as ultraviolet (UV) irradiation. An Australian survey conducted in nursing homes for the elderly found that more than half the patients (54.4%) had at least one skin disease, the most common problems being xerosis (29.5%), onychomycosis (22.5%), dermatitis (8.9%) and skin cancer (4.9%).<sup>2</sup> This article describes the more common skin conditions that occur in an ageing population and provides advice regarding management.

## Skin ageing

Ageing of the skin occurs via two major pathways: intrinsic ageing and photoageing. Intrinsic ageing is an inevitable change over the passage of time, whereas photoageing is the result of chronic sun exposure and is superimposed on intrinsic ageing.

### Intrinsic skin ageing

Major age-related changes in the skin's appearance include dryness, wrinkling, laxity and a variety of benign neoplasms. Aged skin is relatively inelastic and has a slower recovery time after injury. Examples of the functions of human

skin that decline with age include barrier function, cell replacement, DNA repair, epidermal hydration, mechanical protection and wound healing.<sup>3</sup>

There are several theories about the mechanism of intrinsic skin ageing. One is that intrinsic skin ageing is secondary to cumulative damage to biomolecules by free radicals, which results in increased cellular weakness and eventually senescence or apoptosis of skin cells.<sup>5</sup>

### Photoageing

Photoageing is related to the effects of chronic UV-induced damage, and is superimposed on intrinsic ageing. It accounts for most age-associated changes in skin appearance.<sup>6</sup> Features of photoaged skin include dryness, (senile) purpura, telangiectasia, solar keratoses, wrinkling, coarseness and irregular pigmentation (lentigines).

## Senile xerosis and asteatotic dermatitis

Xerosis is a dry, rough quality of the skin that is present in most elderly patients (Figure 1). Although water loss is not increased in aged skin, the water content of the epidermis, particularly the stratum corneum, appears to be reduced.<sup>6</sup> There is no explanation for the pruritus that often accompanies xerosis. Hypotheses include frequent penetration of irritants through an abnormal stratum corneum and an altered sensory threshold due to subtle neuropathy.<sup>7</sup>

Asteatotic eczema/dermatitis is superimposed on dry skin and is frequently found in the elderly, especially during winter. It is often caused by low humidity in a heated environment and presents as dry, fissured skin with fine scale, mostly over the lower legs. This condition may be extremely itchy. It usually responds to the liberal application of moisturisers, which create an inert barrier over the skin surface, trapping moisture underneath, and/or to medium potency topical corticosteroids (ointments

## Key points

- Skin ageing occurs via two pathways: intrinsic ageing and photoageing.
- The skin conditions most commonly seen in the elderly are xerosis, onychomycosis, dermatitis and skin cancer.
- Regular skin checks are recommended in elderly patients who have had excessive cumulative sun exposure, whether or not they have a history of skin cancer.
- Scabies spreads rapidly within nursing homes. However, it is relatively underdiagnosed because the lesions may be atypical. Burrows should be looked for in the web spaces between fingers, in the creases of the wrists and elbows, and on the palms and soles.
- Adverse drug reactions are common in older patients, and are due in part to polypharmacy and comorbidities. Prompt identification and withdrawal of the drug can limit toxic effects.

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Figure 1: Xerotic skin on the legs of an elderly patient.

or creams) to settle inflammation.<sup>8</sup> Weak topical corticosteroid ointments may be used for application to face or flexures. Conservative measures, such as reducing the frequency and duration of showering or bathing, and lowering water temperature, will also help.

## Pruritus

Pruritus is thought to be the most common skin-related complaint of the elderly. In most cases, xerosis is the only cause. Pruritus is often exacerbated by low humidity, frequent bathing or application of irritants to the skin; however, in as many as half of patients, pruritus may have other aetiologies, including metabolic or endocrine disorders such as diabetes mellitus, renal failure, thyroid disease and liver disease. Pruritus can also be a manifestation of a malignant neoplasm, such as lymphoma or leukaemia, or the result of a haematological disease such as polycythaemia rubra vera. Adverse drug reactions can manifest predominantly or exclusively as pruritus, and thus should always be excluded in older patients.<sup>7</sup>

In some cases, the diagnosis is apparent from the history and/or physical examination. When the diagnosis is not apparent, laboratory studies may be indicated. The appropriate initial laboratory investigations for generalised pruritus are:<sup>9</sup>

- Full blood count with differential

- Electrolytes, urea, creatinine
- Liver function tests
- Hepatitis C antibodies
- Thyroid-stimulating hormone
- Chest x-ray.

Identification and treatment of the causes of pruritus usually help to resolve the condition. In those individuals with no obvious cause treatment can be difficult and often unsatisfactory. The use of emollients, soothing preparations such as menthol in calamine, and topical corticosteroids may be helpful, as may ultraviolet B phototherapy. However, most patients with intolerable pruritus are unable to manage topical therapy themselves, and it is often necessary to resort to mildly sedating systemic drugs such as phenothiazine-type antihistamines (promethazine, trimeprazine). There is anecdotal evidence that low dose oral corticosteroids may be effective in the treatment of some patients with pruritus, but this should be considered a last resort as prolonged treatment may be needed.<sup>10</sup>

## Skin cancers

The age-specific incidence of skin cancer, including melanoma, increases exponentially with age.<sup>11</sup> This is presumably due in part to cumulative exposure to carcinogens over a lifetime causing cell damage and the associated risk of mutation when these damaged cells divide.



Figure 2: Nodular basal cell carcinoma on the right nasal bridge.

## Basal cell carcinoma

Basal cell carcinoma (BCC) is a skin cancer commonly found in all age groups, including the elderly. They are slow-growing, locally invasive skin tumours that have a diverse range of clinical appearances and morphology. Examples include nodular, cystic, superficial, morpoeic and pigmented variants, with a higher risk of recurrence associated with infiltrative, micronodular, morpoeic and giant tumour subtypes (Figure 2). Although metastasis is very rare, morbidity results from local tissue invasion and destruction.

Diagnostic accuracy is increased with good lighting and magnification, and a dermatoscope may be helpful in some cases, especially with pigmented BCC. Surgical excision is an effective treatment for primary BCC, with a recurrence rate of less than 2% in the five years following complete excision. In difficult areas (eg, central face, around the eyes, nose, lips and ears) or with large or recurrent lesions, referral for more extensive surgery may often be indicated. In appropriate cases (low-risk small nodular and superficial BCCs), curettage and cautery and/or cryotherapy can be good treatment options. Topical therapy with imiquimod or photodynamic therapy can also be considered in the treatment of superficial BCCs.<sup>13</sup>

## Solar keratosis and squamous cell carcinoma

UV irradiation is the major aetiological factor for skin cancer. Habitual sun exposure in fair-skinned individuals induces both solar keratosis (SK) and squamous cell carcinoma (SCC).



Solar keratoses are hyperkeratotic lesions and the majority of these occur in fair-skinned people who have had excessive exposure to solar UV radiation. There is a low risk of SK transforming into SCC (around 0.1%); however, the presence of SK is an important biomarker of excessive UV exposure and non-melanoma skin cancer (NMSC) risk.<sup>14</sup> If lesions are symptomatic, or there is concern regarding the risk of malignant transformation (large size, multiple lesions, tenderness), treatment may be required. Treatment options for SK include cryotherapy, curettage and cautery, shave biopsy and topical preparations such as 5-fluorouracil, imiquimod and diclofenac gel.<sup>3</sup>

The aim of therapy for confirmed cutaneous SCC is complete removal to prevent recurrence, extension or metastasis. The favoured method of removal is excision with a 3mm to 4mm clinical margin. This can be difficult, depending on the location of the tumour, and referral to a dermatologic or plastic surgeon may be required.

## Melanoma

The elderly, especially men, present with melanomas that are thicker than those of young adults, probably due in part to delayed diagnosis because of failure to examine their skin properly, poor vision and other medical problems, and the fact that these melanomas often occur on a background of multiple benign skin lesions. This delayed diagnosis is the reason that men over 50 have an increased mortality risk from melanoma compared with women or younger men.<sup>15</sup>

Melanomas are described according to their appearance and behaviour. Those that start off as flat patches (ie, have a horizontal growth phase) include:

- Superficial spreading melanoma
- Lentigo maligna melanoma
- Acral lentiginous melanoma (on soles of feet, palms of hands or under nails).

These superficial forms of melanoma tend to grow slowly but, at any time, may progress to a more rapid vertical growth phase.

Melanomas that quickly involve deeper tissues include:

- Nodular melanoma (presenting as a rapidly enlarging lump)
- Mucosal melanoma (arising on lips,

eyelids, vulva, penis, anus)

- Neurotropic and desmoplastic melanoma (fibrous tumour with a tendency to infiltrate nerves).

Lentigo maligna (Hutchinson's melanotic freckle) is an early form of melanoma (melanoma in situ) in which the malignant cells are confined to the tissue of origin, the epidermis of sun-damaged skin. Lentigo maligna melanoma is diagnosed when the malignant melanoma cells have invaded the dermis and deeper layers of the skin. Although all types of melanoma have increased age-specific incidences, lentigo maligna melanoma overwhelmingly develops in people aged over 60, in areas of habitually sun-exposed skin.

Patient education is imperative when it comes to skin cancer, and older patients should be advised to cover up with a hat and protective clothing, as well as wear an SPF30+ sunblock. Patients who have a history of excessive sun exposure, with or without a past history of melanoma or non-melanoma skin cancer, may benefit from having regular skin checks. Taking baseline photographs helps in monitoring any suspicious lesions.

The American Cancer Society's 'ABCDE criteria' provide a useful clinical prediction rule for malignant melanoma with a sensitivity and specificity of 93% and 37%, respectively. The test is considered positive if a lesion exhibits one or more of the five criteria:<sup>16</sup>

- Asymmetry – one half of the lesion is not identical to the other
- Border irregularity – lesion has an uneven or ragged border
- Colour variegation – lesion has more than one colour (ie, black, blue, pink, red or white)
- Diameter – lesion has a diameter greater than 6mm
- Elevation or Enlargement – elevation of lesion above skin surface or enlargement, by patient report.

Another potentially useful diagnostic test is the revised seven-point checklist developed in the United Kingdom. This, too, has a high sensitivity (90%) and low specificity (34%).<sup>16,17</sup> In this test, melanoma should be suspected if there are one or more of the major signs:

- Change in size
- Change in shape
- Change in colour.

In this test too the presence of three or four minor signs without a major sign can also indicate a need to biopsy suspicious lesions:

- Inflammation
- Crusting or bleeding
- Sensory change
- Diameter (7mm or more).

Suspected melanomas should be surgically excised with a narrow margin. If the initial excision is positive then a wider excision (10mm) is usually undertaken. Again, referral to a plastic or dermatologic surgeon may be required. If the melanoma is thicker than 1mm, sentinel node biopsy may be recommended to assist in staging, however, it does not offer any survival advantage.

## Infectious processes

### Bacterial infections

The elderly are often predisposed to cellulitis and erysipelas because of dry skin, oedema, diabetes and poor circulation. Gram-positive bacteria cause most cases (group A streptococci for both and also *Staphylococcus aureus* for cellulitis).

Cellulitis should be clinically distinguished from erysipelas, to guide antibiotic choice. Erysipelas involves the dermis, occurs mainly on the legs and tends to be sharply demarcated, as opposed to cellulitis, which involves the skin and subcutaneous fat and is less well demarcated.<sup>18</sup>

Areas of cellulitis and erysipelas need to be swabbed for culture and treated aggressively with appropriate antibiotics in elderly patients as their comorbidities can increase the already high risk of complications associated with these conditions. These complications include septicaemia, thrombophlebitis, septic arthritis, osteomyelitis and endocarditis.

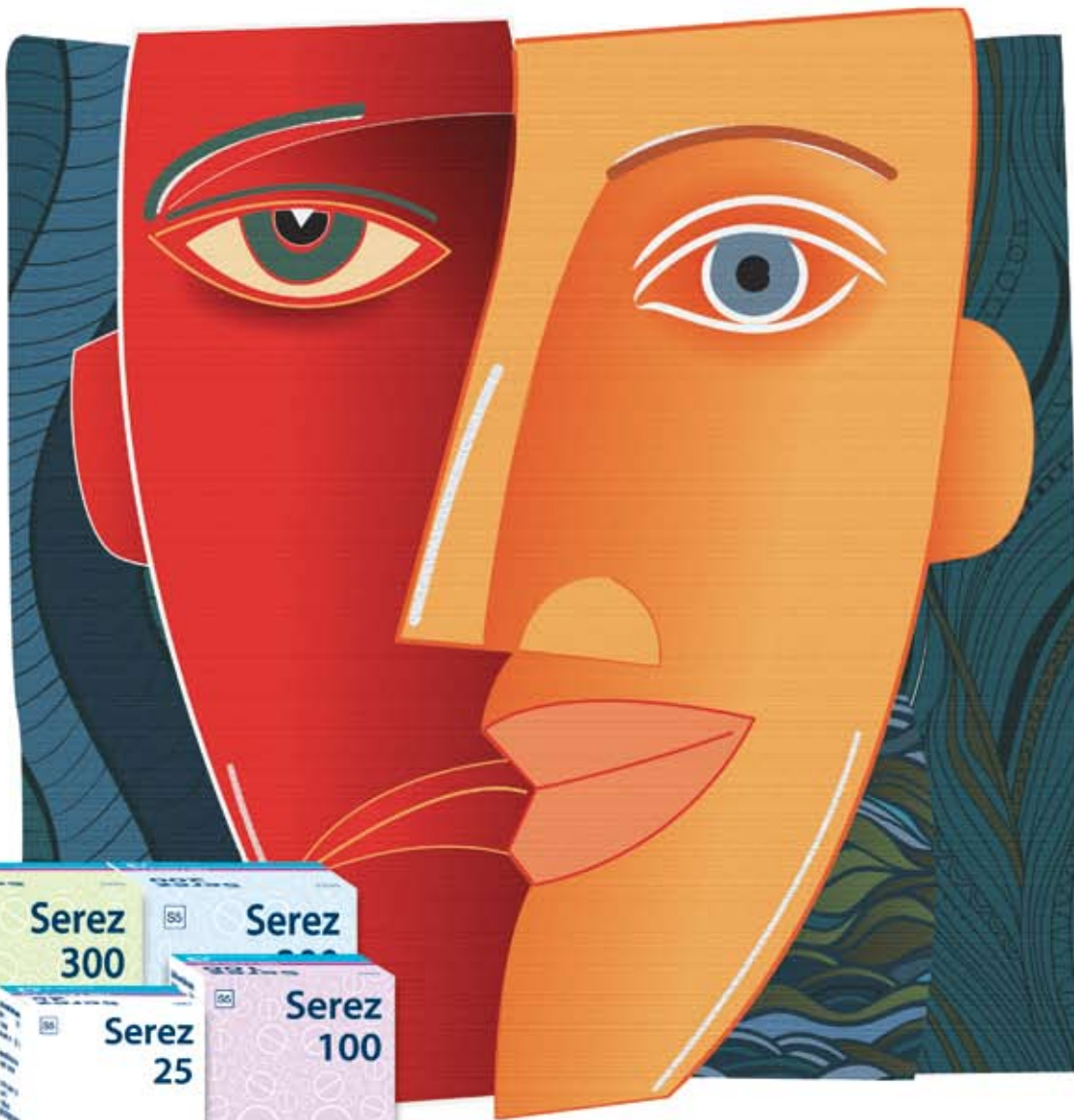
Methicillin-resistant *S. aureus* (MRSA) has become an increasingly important pathogen in hospital and community acquired infections, and age over 80 years is significantly associated with MRSA carriage.<sup>19</sup>

### Parasitic infections (including scabies)

Scabies, a skin infestation with the mite *Sarcoptes scabiei*, can occur in people of any age. However, nursing homes provide a fertile ground for rapid spread

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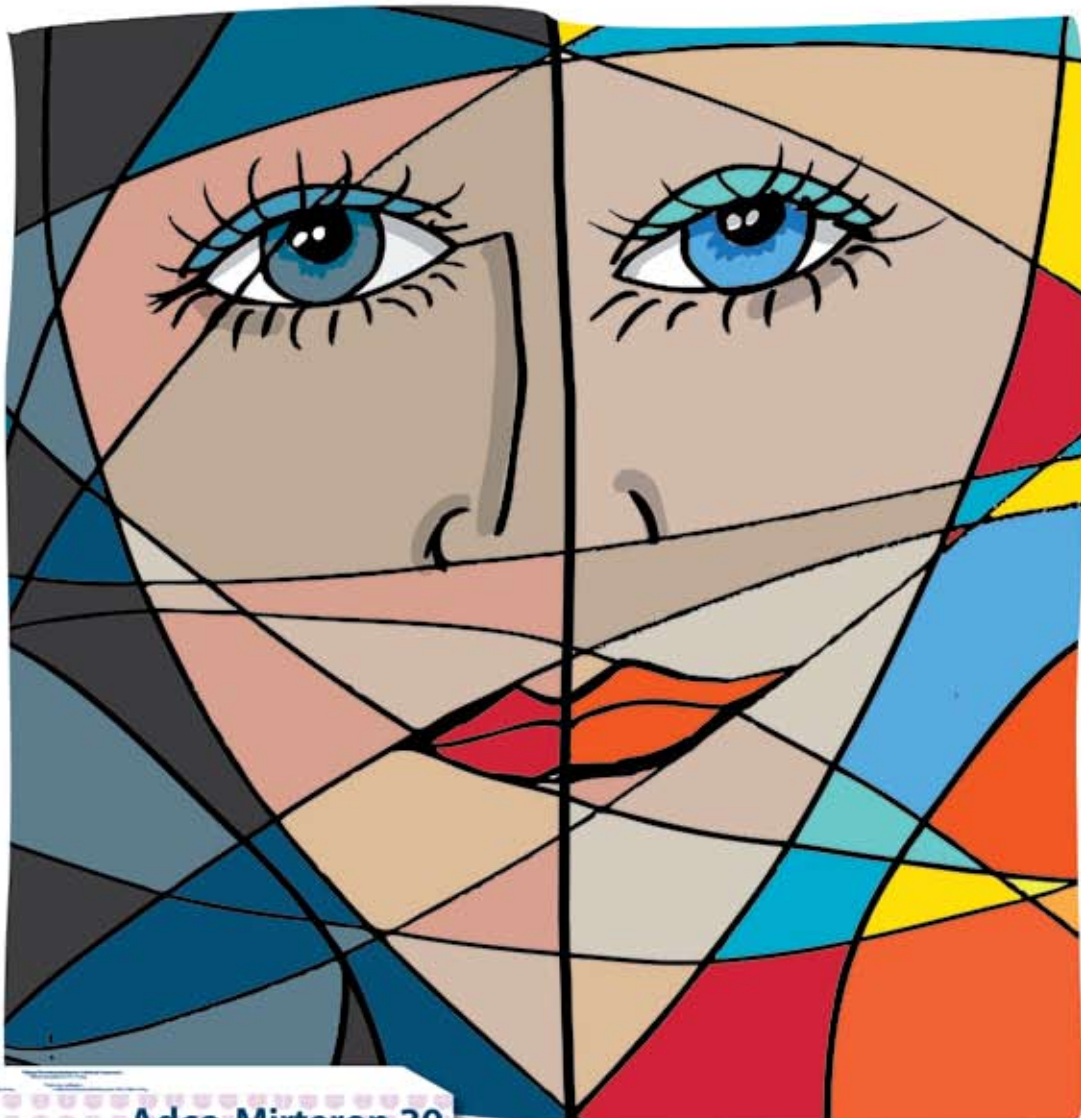
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Figures 3a and b. Scabies. a (far left) Scaetic nodule on the right nipple of a nursing home patient. b (left) Crusted (Norwegian) scabies. Note the burrow on the middle finger (arrow).

of the infestation. In the elderly, partly because of their decreased immunity, lesions may be atypical and, for this reason, scabies is relatively underdiagnosed. In addition, older people often have xerosis, and their pruritus at times may be attributed to this aetiology.

Scabies mites burrow into the skin, where they live and reproduce. Eggs laid in the burrows hatch, and the larvae crawl out onto the skin, make new burrows and mature into adult mites. The skin infestation commonly involves the genital areas, buttocks, lower abdomen, wrists, forearms and webs between the fingers. Burrows can be difficult to see but are most often seen on the webs between the fingers, around the waist, in the creases of the wrists and elbows, and on the palms and soles of the feet.<sup>20</sup> The itchy rash on the limbs and trunk is due to an allergy to the mites and their products. Itchy nodules are often seen on the penis in men, on the nipples in women and around major flexures in children (Figure 3a).<sup>21</sup> Diagnosis may be confirmed by microscopy of a skin scraping.

The topical treatment of choice for scabies is permethrin 5% cream, which should be applied topically to dry skin from the neck down, paying particular attention to the hands and genitalia, and under the nails (using a nailbrush). The cream should be left on the skin for a minimum of eight hours (usually overnight) and reapplied to hands if they are washed. The time may be increased to 24 hours if there has been a treatment failure. There is a better success rate if permethrin is used on two occasions, one week apart. Benzyl benzoate and crotamiton are other treatments used.

Crusted (Norwegian) scabies is a very contagious but less itchy form of scabies in which the mite population on the patient is very high due to poor host response (Figure 3b). It is often confused with eczema. The patient should be quarantined and bedding, clothes and towels should be laundered. If the patient lives in a nursing home, all patients, medical and nursing staff and their families should be treated; if staff from the affected ward have worked elsewhere then that area too should be treated.



Figure 4: Onychomycosis

### Dermatophyte and yeast infections

Onychomycosis (tinea unguium) is present in approximately 35% of people over the age of 60, and tinea pedis is also present in approximately 25% of this patient population (Figure 4).<sup>22</sup> Onychomycosis is most commonly caused by the dermatophytes *Trichophyton rubrum* and *Trichophyton mentagrophytes* var. *interdigitale*. Although tinea pedis (most commonly caused by *T. rubrum*, *T. mentagrophytes* and *Epidermophyton floccosum*) will usually have been present for decades, it may worsen with age. In elderly people with diabetes, interdigital tinea pedis may ulcerate and predispose to bacterial cellulitis. Culture-proven dermatophyte infection of the nails may not respond as well to oral terbinafine in the elderly as it does in younger patients.

Cutaneous infections due to *Candida albicans* are also common in the elderly, especially those with diabetes and other forms of immunosuppression. Intertrigo is a mechanical, frictional problem in the flexures, with frequent secondary infection by *Candida*. Inflammation should be treated with topical corticosteroids, and the use of moisture-absorbing powders can reduce maceration. The *Candida* component should be treated with topical azoles or nystatin.

### Viral infections

Viral infections of note in the elderly include herpes zoster, which is the most common, and also herpes simplex and molluscum contagiosum. Elderly immune-compromised patients are



most at risk of such infections.

Herpes zoster (shingles), a reactivation of the chickenpox or varicella-zoster virus, is primarily seen in older patients, with an incidence of approximately 1500 cases per 100 000 persons annually at age 75.<sup>23</sup> The initial symptom is pain and burning, which is followed by the appearance of grouped vesicles on an erythematous base and in a dermatomal distribution (Figure 5). Herpes zoster can be complicated by eye involvement, which can result in

*Figure 5. Herpes zoster involving the left mandibular branch of the facial nerve, with dissemination.*



### Medications associated with drug-induced skin reactions\*<sup>27</sup>

#### Common causes of exanthematous reactions

- Allopurinol
- Antimicrobials
- Barbiturates
- Captopril
- Carbamazepine
- Frusemide
- Lithium
- Phenytoin
- Thiazides

#### Common causes of fixed drug eruptions

- ACE inhibitors
- Allopurinol
- Antimicrobials
- Barbiturates
- Benzodiazepines
- Calcium channel blockers
- Carbamazepine
- Diltiazem
- Fluconazole
- NSAIDs, including aspirin
- Paracetamol

#### Drugs often associated with photosensitivity reactions

- Amiodarone
- NSAIDs
- Phenothiazines
- Retinoids
- Sulfonamides

- Tetracyclines
- Thiazines

#### Possible causes of cutaneous vasculitic reactions

- Allopurinol
- Aspirin
- Beta-lactam antibiotics
- Carbamazepine
- Carbimazole
- Diltiazem
- Erythromycin
- Frusemide
- Hydralazine
- Interferons
- Methotrexate
- Minocycline
- NSAIDs
- Retinoids
- Sulfamethoxazole-trimethoprim
- Sulfasalazine
- Sulfonamides
- Thiazides
- Thrombolytic agents

#### Possible causes of erythema multiforme or Stevens-Johnson syndrome

- Barbiturates
- Beta-lactam antibiotics
- Carbamazepine
- Chlorpropamide

- Gold
- Histamine H<sub>2</sub>-antagonists
- Lamotrigine
- Leflunomide
- Macrolides
- Mefloquine
- NSAIDs
- Phenothiazines
- Phenytoin
- Rifampicin
- Sulfamethoxazole-trimethoprim
- Sulfonamides
- Tetracyclines
- Thiazides

#### Possible causes of toxic epidermal necrolysis

- Allopurinol
- Antituberculous drugs
- Barbiturates
- Carbamazepine
- Gold
- Griseofulvin
- Lamotrigine
- Leflunomide
- Nitrofurantoin
- NSAIDs
- Penicillins
- Phenytoin
- Salicylates
- Sulfonamides
- Tetracyclines

\*Not a comprehensive list.

Adapted from: Lee A, Thomson J. Drug-induced skin reactions. In: Lee A, editor. Adverse drug reactions, 2nd ed. London: Pharmaceutical Press; 2006. p. 125-156.<sup>27</sup>



Figure 6: Cutaneous drug eruption with mucosal involvement.

serious conjunctivitis, iritis or uveitis. Post-herpetic neuralgia is often debilitating in the elderly.

Systemic therapy with oral famciclovir, valaciclovir or acyclovir can shorten the course of herpes zoster and potentially prevent post-herpetic neuralgia. This treatment is particularly effective if administered within 72 hours of the onset of vesicles. Amitriptyline and pregabalin are commonly used for the treatment of post-herpetic neuralgia.<sup>21</sup>

Herpes zoster can be effectively prevented with appropriate vaccination of individuals over the age of 60. The Shingles Prevention Study demonstrated vaccine efficiency in trial participants with a significant reduction in the incidence of herpes zoster, post-herpetic neuralgia and the burden of illness associated with the infection.<sup>24</sup> Overall, compared with placebo, vaccination reduced the incidence of herpes zoster by 51.3% and the incidence of post-herpetic neuralgia by 66.5% over a median of more than three years of follow up.

## Ulcers

Chronic ulcers of all aetiologies are more common in the elderly than in younger people, most likely because of a combination of impaired wound healing and higher prevalence of underlying

ing diseases. The most common are leg ulcers, usually in the setting of chronic venous insufficiency leading to venous hypertension. Treatment of ulcers depends on the cause, as indicated:

- Venous ulcers are caused by venous reflux through valves, obstruction of veins and/or impaired calf-pumping action. They are usually relatively painless and associated with aching, swollen lower legs that feel more comfortable when elevated. Treatment of these ulcers requires compression, elevation and exercise, which help reduce oedema.
- Arterial ulcers are most often due to atherosclerosis, are often painful and have 'punched out' borders. Re-establishment of adequate arterial supply is required.
- Diabetic foot ulcers are caused by the combination of arterial blockage and nerve damage resulting in repetitive trauma. They are notably located over pressure points, such as heels and the tips of toes. Education and prevention are the keys to management.

Decubitus ulcers, or pressure sores, are far more common in elderly hospitalised patients than in younger patients, as the former tend to be less mobile, needing help turning in bed, and have additional aggravating disorders such as dry skin over bony prominences,

incontinence and/or poor nutritional state. Regular turning and use of pressure-relieving support surfaces aid in prevention. Pressure ulcers are often infected, so any associated infection must be treated.<sup>25</sup>

It is important to consider a diagnosis of skin cancer, most commonly basal cell carcinoma, in the case of non-healing bleeding ulcers.

## Miliaria

Miliaria (sweat rash) arises from obstruction of the sweat ducts. Miliaria rubra (prickly heat) is the most common form of miliaria in the elderly, and results when obstructed sweat migrates into the epidermis as well as the upper dermis, causing itchy inflamed papules around the sweat pores. In contrast to acne and other forms of folliculitis, miliaria lesions do not arise around hair follicles. Miliaria typically occurs on the backs of people who lie in bed for prolonged periods, but also commonly occurs during humid summer weather or in winter when people wear multiple layers of clothing.

Conservative management of miliaria focuses on avoiding further sweating and irritants (eg by avoiding excessive clothing, friction from clothing and excessive use of soap, and by wearing breathable fabrics). A useful topical therapy is the combination of 2% salicylic acid and 1% chlorhexidine (in 70% ethanol) used sparingly over the affected areas until resolution.

Grover disease is a skin condition affecting the chest and back that is also seen frequently in overheated, bed-bound people. The cause is unknown, and most cases last six to twelve months. It often starts suddenly and is more common in winter than in summer in the elderly population. Erythematous blistered, crusted or eroded papules are seen on the central back, mid-chest and occasionally elsewhere. The condition is often itchy but can be asymptomatic. It may occasionally be complicated by the development of dermatitis, usually in a nummular pattern.

There is no curative treatment but possibly helpful options include keeping cool and applying emollients, anti-pruritic lotions or mild corticosteroid creams. Calcipotriol cream has been





reported to be of benefit for some patients, as has a course of tetracycline or an oral antifungal agent (eg, itraconazole).

### Bullous pemphigoid

Bullous pemphigoid is more common in people older than 60 and is the most often seen of the autoantibody-mediated blistering disorders in the elderly. The blisters are large and tense and most commonly seen in the flexures, trunk and limbs. They may arise from urticarial papules or plaques. Although it is a self-limited condition that frequently resolves within six to 12 months, elderly patients may experience increased morbidity and mortality because of debilitated general health or as a side effect of treatment.<sup>26</sup>

Occasionally, potent topical corticosteroids can control localised forms of bullous pemphigoid but most cases require oral prednisolone, with doses varying depending on severity of disease. Less extensive disease may require only 0.3 to 0.5mg/kg of prednisolone, whereas more extensive and severe forms may require up to 1mg/kg. If high-dose oral corticosteroids are contraindicated, doxycycline may be used, either alone or as a corticosteroid sparing agent.<sup>21</sup> Healing with scarring is rare but there may be hyper- or hypopigmentation.

### Drug eruptions

Adverse drug reactions of all kinds are much more common in older patients, partly because the elderly consume more medications than younger people and partly because of medical conditions (eg, impaired renal, hepatic or cardiac function) that affect drug metabolism or excretion. The most frequently observed adverse cutaneous drug reactions are pruritus, exanthems and urticaria, but the most severe are Stevens–Johnson syndrome and toxic epidermal necrolysis (Figure 6).

Diagnosis of a drug eruption requires taking a careful history of all prescription medications as well as those purchased over the counter. Drugs that are well known for causing cutaneous reactions include antimicrobial agents, NSAIDs, chemotherapeutic agents, anticonvulsants and psychotropic agents (see the box on page).<sup>27</sup> Prompt identification and withdrawal of the offending agent can help to limit its toxic effects.

### Conclusion

Ageing of skin and cumulative UV damage make older patients more susceptible to a wide variety of skin conditions, many of which can be severely debilitating. It is important to be aware of the more common presentations of these dermatoses so that early intervention and treatment can commence.

*References are available on request.*

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