

# Rosacea and atopic dermatitis

## *Two common oculocutaneous disorders*

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### ABSTRACT

**OBJECTIVE** To increase awareness of the oculocutaneous manifestations of two common skin diseases.

**QUALITY OF EVIDENCE** We reviewed clinically relevant articles from the dermatologic and ophthalmologic literature. The PubMed database was searched from January 1965 to January 2001 to locate retrospective and prospective cohort and descriptive studies using the MeSH terms acne rosacea; eczema; and dermatitis, atopic. Most literature on the topic is based on descriptive research.

**MAIN MESSAGE** Several dermatologic problems are known to have ophthalmologic sequelae. Rosacea and atopic dermatitis are two common skin conditions that can have concomitant eye disease. Degrees of skin and eye disease vary; certain cases require specialty referral and other cases can be managed effectively by family physicians.

**CONCLUSION** Better appreciation of how rosacea and atopic dermatitis overlap with eye disease will result in more appropriate referrals and more comprehensive patient care.

### RÉSUMÉ

**OBJECTIF** Accroître la sensibilisation aux manifestations oculo-cutanées de deux maladies fréquentes de la peau.

**QUALITÉ DES DONNÉES** Nous avons examiné les articles pertinents sur le plan clinique des ouvrages en dermatologie et en ophtalmologie. La base de données PubMed a fait l'objet d'une recension, de janvier 1965 à janvier 2001, pour trouver des études rétrospectives et prospectives de cohortes ainsi que des études descriptives à l'aide des termes MeSH en anglais pour «acné rosacée», «eczéma» et «dermatite, atopique». La majorité des ouvrages sur le sujet se fondent sur des recherches descriptives.

**PRINCIPAL MESSAGE** Plusieurs problèmes dermatologiques sont reconnus pour avoir des séquelles ophtalmologiques. L'acné rosacée et la dermatite atopique sont deux maladies courantes de la peau qui peuvent présenter une affection concomitante de l'œil. Les degrés de sévérité des maladies de la peau et de l'œil varient; certains cas exigent un aiguillage vers un spécialiste et d'autres peuvent être efficacement pris en charge par les médecins de famille.

**CONCLUSION** Une meilleure appréciation de la façon dont l'acné rosacée et la dermatite atopique peuvent être concomitantes à une maladie de l'œil se traduira par des aiguillages plus appropriés et des soins plus complets aux patients.

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*Cet article a fait l'objet d'une évaluation externe.*

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**P**rimary care providers often encounter cutaneous and ocular complaints. As gatekeepers in our health care system, primary care physicians need to have some appreciation of the relationship between eye and skin complaints. The ectodermal origin of the epidermis and of many eye structures can in part explain the association.

Rosacea, atopic dermatitis, seborrheic dermatitis, psoriasis, bullous disorders, and other less common skin conditions can have concomitant ocular complaints. Rosacea and atopic dermatitis are reviewed because of the frequency with which both skin and ocular complaints present to primary care practices.

### Quality of evidence

A PubMed search of English-language literature from January 1965 to January 2001 revealed a combination of prospective cohort studies and descriptive studies, with a predominance of descriptive studies based on clinical experience. The MeSH terms eye; skin; acne rosacea; eczema; and dermatitis, atopic, were used, as were the non-MeSH terms ocular and oculocutaneous. Articles were selected for assessment if they provided complete clinical reviews that would be relevant to family physicians. Thus, while several prospective cohort studies were used in this review, particularly for treatment options, most papers were selected because they provided a thorough review of the clinical presentation of these disorders.

### Rosacea

Rosacea is a relapsing chronic inflammatory skin condition affecting up to 10% of the population.<sup>1,2</sup> It is characterized by erythema, telangiectasia, papules, pustules, sebaceous gland hypertrophy, and rhinophyma in severe cases.<sup>3,4</sup> Lesions are usually symmetric and are found on the nose, cheeks, chin, and forehead, and less commonly on the neck, scalp, and chest.<sup>1,4</sup> Episodic flushing is also common and can be provoked by consumption of hot beverages, spicy foods, and alcohol.<sup>4</sup> This condition is distinguished from acne vulgaris by the absence of comedones.<sup>4</sup>

Although patients can be affected at any age, peak incidence is in the fourth to seventh decades.<sup>1,3</sup> While the condition is often thought to be more common in women and people of northern European descent,

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**Table 1. Eye features of rosacea**

Sensation of a foreign body
Tearing
Pain
Photophobia
Pruritus
Stinging
Burning
Blurry vision
Blepharitis
Conjunctival hyperemia
Hordeolum and chalazion
Reduced visual acuity
Keratoconjunctivitis sicca
Corneal vascularization, infiltration, ulceration, and perforation
Superficial punctate keratopathy
Rosacea keratitis
Meibomitis
Interstitial keratitis
Iritis
Nodular conjunctivitis
Episcleritis

the literature is unresolved on this issue.<sup>3,4</sup> The pathogenesis of this condition is multifactorial and still under debate, but includes such factors as increased flushing, solar elastosis damage to the dermis, and possibly mites (*Demodex folliculorum*).<sup>1</sup>

Ocular involvement with rosacea is an underappreciated and underdiagnosed manifestation, despite its presence in as many as 50% of patients with this condition (Table 1).<sup>4,7</sup> In patients with ocular and cutaneous rosacea, approximately 53% have the cutaneous eruption first, 20% the eye findings first, and 27% both simultaneously at onset.<sup>8</sup> Peak incidence for ocular rosacea is later (sixth and seventh decade) than for cutaneous rosacea, which affects women twice as often as men; there is no sex predilection in ocular rosacea.<sup>2</sup> There is a strong correlation between the degree of ocular involvement and the tendency to flush.<sup>9</sup>

Ocular findings can be considered as either minor or major; minor findings are more common.<sup>6</sup> Ophthalmic findings are nonspecific on their own and are independent of the severity of the skin disease.<sup>1,3,8</sup> Initial ocular complaints consist of sensation of a foreign body, tearing, pain, photophobia, scratchiness, stinging and burning, and blurred vision.<sup>2,3,10-12</sup> Abnormal tear

breakup time causes dry spots to form more readily.<sup>2</sup> Blepharitis has been reported in 93% of patients with ocular rosacea and conjunctival hyperemia in 86%.<sup>10</sup> A history of recurrent hordeolum and chalazion (22%)<sup>10</sup> is also common,<sup>4,13</sup> as is keratoconjunctivitis sicca in as many as 40% of patients.<sup>14</sup> Approximately 60% of patients with chalazion have rosacea.<sup>15</sup>

Rosacea keratitis can be associated with pain, photophobia, and sensation of a foreign body. It consists of a triangular peripheral vascularization of the cornea, often the inferior cornea. Each recurrence results in vascularization and scarring migrating toward the central cornea.<sup>1</sup> Rosacea keratitis is a serious concern because ulcers can develop both peripherally and centrally; deep ulcers can result in perforation.<sup>16</sup> Superficial punctate keratopathy (41%),<sup>10</sup> corneal vascularization, infiltrations, ulceration, perforation, and reduced visual acuity sometimes appear.<sup>4,13</sup> Interstitial keratitis (7%)<sup>10</sup> and iritis (10%)<sup>10</sup> are less common complications.

Rosacea is a clinical diagnosis that is controlled by medical management and patient education. In chronic or severe cases where telangiectasia and rhinophyma exist, surgery, electrocautery, or laser therapy are beneficial.<sup>4</sup> Patient education should focus on realistic expectations for the condition and on avoidance or minimization of triggers, such as exposure to extreme heat or cold or excessive sun, ingestion of hot or spicy foods, and alcohol.<sup>3,4</sup>

The mainstay of treatment is oral tetracycline, although minocycline and doxycycline are good alternatives.<sup>3,4</sup> Erythromycin can be used if patients are intolerant of tetracyclines. Topical metronidazole in a 0.75% gel or cream or 1% cream can be applied daily, has been shown to reduce inflammatory lesions and erythema, and might prevent relapse.<sup>17-19</sup> Ocular rosacea is best managed with oral antibiotics and lid hygiene. Both tetracycline and doxycycline are effective for cutaneous and ocular rosacea. Low-dose isotretinoin is used occasionally for severe, antibiotic-resistant ocular rosacea.<sup>11</sup>

Cessation of therapy can lead to relapses; many patients require long-term maintenance therapy.<sup>4</sup> Thorough lid hygiene with warm soaks or dilute baby shampoo is highly beneficial in managing blepharitis.<sup>3,4</sup> Corticosteroids, if carefully used, can be helpful for the blepharitis, episcleritis, keratitis, and iritis seen with this condition.<sup>6</sup> Schirmer tests often reveal reduced tear production, which can be managed with tear substitutes.<sup>10</sup>

Primary care physicians can manage this condition if they feel comfortable doing so. Dermatology and ophthalmology consultation is beneficial in many

circumstances, and the psychosocial aspects of the condition should not be overlooked.

### Atopic dermatitis

Atopic dermatitis is a common, pruritic, chronically relapsing skin disease often seen in association with personal or family history of hay fever, asthma, allergic rhinitis, or atopic dermatitis.<sup>20</sup> Onset is often in the first few months of life, by the first year in 60% of cases.<sup>20</sup> The skin in atopic dermatitis can appear erythematous, excoriated, lichenified, and hypopigmented; cutaneous infections frequently compound the condition.<sup>21,22</sup> Patients are prone to viral infections, such as herpes simplex, molluscum contagiosum, and human papillomavirus; superficial fungal infections; and bacterial infections, such as *Staphylococcus aureus*.<sup>22</sup> In infants, lesions are often exudative and crusted and are distributed on the forehead, cheeks, and extensor surfaces of the extremities. Older children and adults typically have lichenification and flexural involvement of the extremities. Adults often have chronic hand dermatitis.

Eye complications in atopic dermatitis can be a source of substantial morbidity (**Table 2**). Generally, patients report photophobia and pruritus.<sup>23</sup> A Dennie-Morgan fold, infraorbital darkening, eyelid dermatitis, and blepharitis are common.<sup>23</sup> Atopic keratoconjunctivitis occurs in one quarter of patients, often presenting

**Table 2. Eye features of atopic dermatitis**

Dennie-Morgan fold
Infraorbital darkening
Eyelid dermatitis
Photophobia
Pruritus
Papillary hypertrophy and hyperemia
Burning
Keratoconus
Blepharitis
Conjunctival hyperemia
Punctate corneal staining
Retinal detachment
Atopic keratoconjunctivitis
Corneal staining, scarring, ulceration, and vascularization
Cataracts
Scarring and shrinking of fornices
Increased mucus production
Superficial and herpes simplex keratitis
Loss of lateral portion of eyebrow

## CME

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### Rosacea and atopic dermatitis

with bilateral itchy, watery eyes and copious mucoid discharge.<sup>21,22</sup> Atopic keratoconjunctivitis usually begins in the late teens. Papillary hypertrophy, hyperemia, scarring and shrinking of the fornices, punctate corneal staining, scarring, ulceration, and vascularization can occur.<sup>24</sup> Due to the vascularization and risk of rejection, corneal transplantation is often unsuccessful. Keratoconus (cone-shaped corneal ectasia), cataracts (typically posterior subcapsular cataracts), and retinal detachment have also been associated.<sup>21,25</sup> Along with the increased incidence of herpes simplex infection of the skin in atopic patients, herpetic keratitis is frequently observed. This keratitis can be severe and bilateral, and can recur frequently.<sup>26</sup>

There does not appear to be any correlation between the severity of the cutaneous condition and ocular changes.<sup>23</sup> Management of ocular manifestations includes use of cold compresses and vasoconstrictors to reduce swelling, avoidance of inciting allergens, and refraining from rubbing the eyes.<sup>21</sup>

As a systemic disease, atopic dermatitis requires that management focus on and treat all sites of inflammation. Troublesome atopic dermatitis often requires the assistance of a dermatologist. A multidisciplinary approach to this condition, which can include the assistance of ophthalmologists, allergists, immunologists, or psychiatrists, is beneficial.<sup>21</sup> ❁

#### Competing interests

None declared

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#### References

1. Donshik PC, Hoss DM, Ehlers WH. Inflammatory and papulosquamous disorders of the skin and eye. *Dermatol Clin* 1992;10(3):533-47.
2. Quarterman MJ, Johnson DW, Abele DC, Leshner JL, Hull DS, Davis LS. Ocular rosacea: signs, symptoms, and tear studies before and after treatment with doxycycline. *Arch Dermatol* 1997;133:49-54.
3. Knox CM, Smolin G. Rosacea. *Int Ophthalmol Clin* 1997;37(2):29-40.
4. Mannis MJ, Macsai MS, Huntley AC. *Eye and skin disease*. Philadelphia, Pa: Lippincott-Raven Publishers; 1996.
5. Starr PA. Oculocutaneous aspects of rosacea. *Proc R Soc Med* 1969;62:9-11.
6. Browning DJ, Proia AD. Ocular rosacea. *Surv Ophthalmol* 1986;31:145-58.
7. Kligman AM. Ocular rosacea. Current concepts and therapy. *Arch Dermatol* 1997;133:89-90.
8. Borrie P. Rosacea with special reference to its ocular manifestations. *Br J Ophthalmol* 1953;65:458.
9. Wilkin JK. Rosacea. *Int J Dermatol* 1983;22:393-400.
10. Gudmundsen KJ, O'Donnell BF, Powell FC. Schirmer testing for dry eyes in patients with rosacea. *J Am Acad Dermatol* 1992;26:211-4.
11. Maddin S, editor. Rosacea. *Skin Ther Lett* 1998;3(3):3-4.
12. Jenkins MS, Brown SI, Lempert SL, Weinberg RJ. Ocular rosacea. *Am J Ophthalmol* 1979;88:618-22.
13. Elkington AR, Khaw PT. ABC of eyes. General medical disorders and the eye. *BMJ* 1988;297(6645):412-6.
14. Lemp MA, Mahmood MA, Weiler HH. Association of rosacea and keratoconjunctivitis sicca. *Arch Ophthalmol* 1984;102:556-7.

#### Editor's key points

- Due to their common ectodermal background, dermatologic conditions are associated with ocular complications more frequently than is usually recognized.
- Ocular involvement in rosacea occurs in up to 50% of cases, and more frequently among patients in their 60s and 70s. Common symptoms are sensation of a foreign body in the eye, blepharitis, and recurrent styes or chalazion.
- Treatment consists of antibiotics (tetracycline) and good lid hygiene with warm soaks and diluted baby shampoo.
- Atopic dermatitis also has many ocular complications, including eyelid dermatitis, blepharitis, and keratoconjunctivitis.

#### Points de repère du rédacteur

- En raison de leur souche ectodermique commune, les conditions dermatologiques sont associées à des complications ophtalmologiques plus souvent qu'on ne s'en rend compte habituellement.
- Des problèmes oculaires se présentent dans 50% des cas d'acné rosacée et plus fréquemment chez les personnes dans la soixantaine et plus. Les symptômes courants sont une sensation de la présence d'un corps étranger dans l'œil, la blépharite et des orgelets ou des chalazions récurrents.
- Le traitement consiste en une antibiothérapie (tétracycline) et une bonne hygiène de la paupière avec des compresses chaudes et du shampooing pour bébé dilué.
- La dermatite atopique présente aussi plusieurs complications oculaires, y compris la dermatite de la paupière, la blépharite et la kérato-conjonctivite.

15. Lempert SL, Jenkins MS, Brown SI. Chalazia and rosacea. *Arch Ophthalmol* 1979;97:1652-3.
16. Mondino BJ, Manthey R. Dermatological diseases and the peripheral cornea. *Int Ophthalmol Clin* 1986;26(4):121-36.
17. Bleicher PA, Charles JG, Sober AJ. Topical metronidazole therapy for rosacea. *Arch Dermatol* 1987;123:609-14.
18. Jorizzo JL, Leibold M, Tobey RE. The efficacy of metronidazole 1% cream once daily compared with metronidazole 1% cream twice daily and their vehicles in rosacea: a double-blind clinical trial. *J Am Acad Dermatol* 1998;39:502-4.
19. Dahl MV, Katz I, Krueger GG, Millikan LE, Odom RB, Parker F, et al. Topical metronidazole maintains remissions of rosacea. *Arch Dermatol* 1998;134:679-83.
20. Fitzpatrick TB, Johnson RA, Wolff K, Polano MK, Suurmond D. *Color atlas and synopsis of clinical dermatology*. 3rd ed. New York, NY: McGraw-Hill; 1997.
21. Casey R, Abelson MB. Atopic keratoconjunctivitis. *Int Ophthalmol Clin* 1997;37(2):111-7.
22. Freedberg IM, Eisen AZ, Wolff K, Austen KF, Goldsmith LA, Katz SI, et al. *Fitzpatrick's dermatology in general medicine*. 5th ed. New York, NY: McGraw-Hill; 1999.
23. Gelmetti C. Extracutaneous manifestations of atopic dermatitis. *Pediatr Dermatol* 1992;9(4):380-2.
24. Dixon WS. Ocular allergies. *Practical allergy & immunology* 1995;10:84-8.
25. Higaki Y, Ogawa Y, Takamura E, Kawashima M. Retinal breaks in patients with severe atopic dermatitis. *J Am Acad Dermatol* 1994;30:502-3.
26. Easty D, Entwistle C, Funk A, Witcher J. Herpes simplex keratitis and keratoconus in the atopic patient: a clinical and immunological study. *Trans Ophthalmol Soc UK* 1975;95:267-76.