

What Optometrists Should Know about the Comorbidities of Keratoconus

I promise this isn't just another [review article on keratoconus](#). There are more than enough reviews out there explaining suspected pathophysiology, signs, symptoms, and treatments. Everyone reading this is familiar with the highlights: corneal thinning, irregular astigmatism, eye rubbing, et cetera. But after we've come up with an ocular treatment plan (i.e. recommended [corneal cross linking](#), throw a contact lens on their eye, the works), are we done? Or are there other things we as eye care providers should be doing to benefit the overall health of our keratoconic patients—for instance, checking for disorders that are frequently comorbid with keratoconus, such as sleep apnea, allergies, and asthma?

One in 2000. That's the number that's thrown around in school when discussing the prevalence of keratoconus. More recent studies have shown the number is probably closer to one in 400.¹ So if you're seeing 20 patients a day, then chances are you'll be seeing about one per month.

And you will be seeing them.

Because the primary symptom of keratoconus is blurred vision, they may be seeing you more frequently than any other health care provider. In fact, you may be the only health care provider they see. That makes us gatekeepers to the health system for many of these patients. As a result, it's our responsibility to be aware of the associated systemic issues with keratoconus.

If you're like me, that responsibility is kind of scary. Fortunately, it doesn't appear as though the keratoconic population as a whole dies sooner than the rest of our patients. The overall mortality rate for those with

keratoconus is similar to that of the general population.² However, a subset of the population is at risk for additional chronic issues that can increase the mortality rate and decrease quality of life.

Sleep Apnea

In a recent meta-analysis looking at the association between [sleep apnea](#) and keratoconus in *Optometry and Vision Science*, researchers found that those with keratoconus are 1.8x more likely to have sleep apnea than the general population. The prevalence of sleep apnea in the general population is around 5% (but likely underdiagnosed), so we can estimate around 9% of keratoconics suffer from sleep apnea from the given data.³

For those individuals with severe sleep apnea, their risk of death is 1.5 to two times higher than those without the disease.⁴ In terms of quality of life, use of a CPAP device by patients with severe disease increased their quality of life significantly.⁵

So what do all these odds ratios and hazard ratios mean for us? It doesn't mean we need to make a diagnosis or treat, but it does mean we should be screening some of these patients. Validated questionnaires such as the [Berlin Questionnaire](#) are quick and easy for the patient to perform while waiting. If patients are determined to be at risk, a simple referral to their PCP or specialist for a sleep study may be warranted.

Atopy

A connection between those patients who are predisposed to allergy (atopic) and keratoconus has been known for awhile. The focus has primarily been on whether our atopic patients are more likely to rub their eyes and potentially cause development or worsening of keratoconus. While the results of studies on eye rubbing have conflicted in the past, the more recent results do show a significant correlation between both development and progression with those individuals that rub their eyes.⁶ So if eye

rubbing is a risk factor, our keratoconic patients should have higher rates of atopy associated diseases like asthma, allergic rhinitis, and eczema. This does, in fact, appear to be the case—kind of.

In 2016, charts of 16,000 keratoconics were reviewed and matched with 16,000 patients who didn't have keratoconus. Keratoconics were 1.3x more likely to have asthma than non-keratoconics, but rates of allergic rhinitis are similar between groups.⁷ It appears that some (but not all) issues that our atopic patients suffer from occur in higher rates in the keratoconic population. Depending on the associated condition, our patients' risk for mortality and morbidity can be increased.

Like sleep apnea, asthma can reduce quality of life and increase risk of death.^{8,9}

Also similarly to sleep apnea, [questionnaires](#) can be given in office to help identify at-risk patients who may need a referral for further evaluation.

Putting it into practice

Now, any time I have a keratoconic patient in the office for [specialty contact lens](#) referral, I screen them with a questionnaire or ask patients whether or not they've been tested for sleep apnea, asthma, or allergies. If not, I make sure there is a plan in place to get the appropriate testing done. With this approach, we not only improve their quality of life from a visual standpoint, but also can start them on a road to relief from associated conditions.

References

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