Fibromyalgia and Dry Eye Disease

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Dry Eye Disease (DED)

Dry Eye is a disease with a worldwide prevalence of 5-34% of the population. It is characterized by symptoms such as dryness, burning sensation, foreign body feeling, itching, visual disturbance and others, reduced tear production and/or wrong composition of the tear film. Clinically, the tear film is instable and – in moderate to severe cases – damage of the ocular surface is present. Inflammation of the ocular surface and the lacrimal gland as well as neurosensory abnormalities play an important role in the pathogenesis of the disease. Many risk factors are known including age, female sex, estrogen replacement therapy in menopause, collagen vascular disease, ocular surgery (e.g. corneal refractive surgery) and specific medications such as topical/oral anti-allergics, betablocker, and anti-depressants.

DED and Pain Syndromes

DED is often seen in association with chronic pain syndromes. In these patients, symptoms are worse (with equal clinical findings) and quality of life is reduced compared to patients without chronic pain syndromes. A clinical symptom often observed in these patients apart from the typical symptoms of DED is hypersensitivity to light and wind. The ocular pain can often not be reduced by application of an anesthetic eye drop, indicating neuropathic, centralized pain.

DED and fibromyalgia

Fibromyalgia is a chronic pain syndrome characterized by pain in different parts of the body. Typically, the pain manifests in skin, muscles, and joints, however, also fatigue, difficulty concentrating and sleeping disorders may occur. Ocular symptoms such as foreign body feeling, eye irritation and blurred vision may develop, but were only included in the revised diagnostic criteria for fibromyalgia in 2010.
Recent data confirm that 20-35% of patients with fibromyalgia suffer from DED. In a study from Taiwan, the prevalence of DED in patients with fibromyalgia was 7.37/10.000, and thus significantly increased to a population without fibromyalgia 4.81/10.000. The rate of DED was highest in the age group 50-64 years with 9.38/10.000. Further studies showed that the activity of fibromyalgia was associated with the severity of DED. It seems, that patients with fibromyalgia carry a risk to develop DED from young age. The lifetime risk for DED was increased by 80% in patients below 50 years of age with fibromyalgia.

In addition, medications for the treatment of fibromyalgia such as antidepressants may reduce tear production and may thus induce or worsen the disease.
The exact pathomechanism of DED in fibromyalgia is not known in detail. Many factors argue for an inflammatory/autoimmune event affecting lacrimal gland and ocular surface. Increased inflammatory markers were detected in tears and blood of patients with fibromyalgia. Interesting to note in this context is that vitamin D levels of patients with fibromyalgia were significantly decreased compared to controls. Low vitamin D levels were associated with DED, and vitamin D replacement improved tear quality and ocular surface. A further interesting observation is that patients with fibromyalgia show signs of “small fiber disease” in corneal nerves using in vivo confocal microscopy. Some authors could demonstrate that corneal sensitivity was increased in fibromyalgia patients. This clinical sign together with typical symptoms of hypersensitivity to wind and light may indicate a neuropathic ocular pain and may explain the discrepancy of massive ocular symptoms in patients with mild ocular signs of DED.

Diagnosing DED in patients with fibromyalgia

The diagnostic approach does not differ in DED patients with and without fibromyalgia. The diagnosis is made on the ground of typical subjective symptoms and clinical signs. Examinations included tear film break up time, staining of the ocular surface with fluorescein to evaluate ocular surface damage, analysis of the aqueous tear film (eg with Schirmer testing), and a clinical examination of lid margins and meibomian glands. Especially the intensity of corneal and conjunctival fluorescein staining correlates with the severity of DED. Tear film osmolarity and inflammatory markers in the tear film such as MMP-9 may be investigated in addition to estimate the inflammatory activity at the ocular surface. Corneal sensitivity testing and the application of one drop of topical anesthesia may be helpful in making the diagnosis of neuropathic pain.
The severity of DED correlates with the activity of the underlying fibromyalgia.

Treatment of DED in patients with fibromyalgia

Patients with fibromyalgia are treated according to the well-known treatment algorithms (eg. DEWS II report, 2017). Artificial tears are the mainstay of treatment for all severities of DED and should be recommended without preservatives. In

addition, a correction of negative environmental factors (heating, air condition, PC-work, dust etc.), healthy nutrition (possibly with additional omega fatty acids), and a change/discontinuation of certain medications (anti-allergics, beta blockers, anti-depressants) may be helpful. Lid hygiene with hot compresses and lid massage is an essential treatment in meibomian gland disease. If the basic treatment with artificial tears and lid hygiene does not improve symptoms and signs of DED and/or in cases of clear-cut inflammation of the ocular surface, anti-inflammatory treatment must be employed. This may be topical corticosteroids for short term (best non-preserved "soft steroid") and Ciclosporin 0.1% for long-term use. In addition, topical and/or oral antibiotics with anti-inflammatory properties are used in the management of meibomian gland disease.

The treatment of neuropathic ocular pain is complex. If treatment of the DED-component of the disease does not improve the situation, involvement of a pain specialist and/or psychotherapy to deal with the ocular pain may be necessary.

Conclusion

DED is common in fibromyalgia. Therefore, an ophthalmological exam should be part of the work up of fibromyalgia patients and DED should be managed adequately. Corneal nerves may undergo changes in fibromyalgia known as "small fiber disease". These corneal nerves may be analyzed directly using in vivo confocal microscopy in specialized eye clinics. This could further elucidate the pathomechanisms involved in fibromyalgia and spare skin biopsies to detect neural changes.

Literatur

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