Ocular Update

Losing sleep over apnoea-glaucoma link

Some studies suggest patients with primary open-angle glaucoma have increased rates of snoring, insomnia and excessive daytime sleepiness (symptoms typical of OSA). Yet, another study showed the greater the number of apnoea symptoms OSA patients exhibited, the greater the increase in intraocular pressure (IOP), visual field loss variance, and glaucomatous optic disc changes. However, some studies did not find a correlation between glaucoma and OSA, so definitive conclusions can’t be made at this time. There may also be other factors involved that could determine an OSA patient’s risk for eye disease.

O ne suspect eye disease is papilledema. It is caused by raised intracranial pressure and has suspected links to both apnoea and hyperventilation. Here, studies suggest hypoxia and hypercapnia caused by the breathing abnormalities characteristic of OSA raise intracranial pressure by causing vasoconstriction in the cerebral arteries. The authors found one small study where 33 per cent of patients with intracranial hypertension had OSA and that their eye symptoms improved after the OSA was treated.

Although it has been suggested that intermittent apnoeic episodes lead to a deterioration of visual function and (or) ischemic damage to the optic nerve, one cannot rule out the possibility that the relation is mediated by additional factors, the authors wrote. In other words, apnoea could be one of several contributing factors to vision problems in some patients, or possibly work in concert with other variables.

Edward M Weaver MD, associate professor of otorhinolaryngology and chief of sleep surgery at the University of Washington was not particularly surprised by the study’s findings. He was not part of the study group, but noted, “The possible effect of obstructive sleep apnoea on ocular disease is another interesting relationship that deserves further investigation. There is growing evidence of many effects of obstructive sleep apnoea on other organ systems.”

He said that the article provides a good summary of preliminary data that are out there that begin to support a relationship between OSA and specific ocular disorders, and it hypothesizes the pathophysiological mechanisms.

OSA has effects on various physiological mechanisms that may affect organs and physiologic systems. Transient changes in blood pressure, intermittent hypoxia, and sympathetic activation are only some of the possible mechanisms through which OSA could cause damage.

From an ophthalmology perspective there aren’t enough data to support changes in the management of patients with eye disease and OSA, but there are enough compelling data to warrant further study, according to Dr Trope. However, he added if ophthalmologists have patients who are middle-aged and overweight, and are OSA suspects, it’s worth referring them for a sleep assessment.

Accurate diagnosis of preseptal and orbital cellulitis essential

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Pippa Wyssong

in Toronto

O BSTRUCTIVE sleep apnoea (OSA) could now be added to the list of suspected risk factors for glaucoma and other optic nerve diseases, according to a recent review of the topic in the Canadian Journal of Ophthalmology (CJO). But authors of the review say more study is needed to determine just how much OSA contributes to eye disease.

There are several features of OSA that could potentially affect the health of the optic nerve, according to Sukhjeet Dhillon MSc, from Canada’s University of Waterloo School of Optometry and colleagues.

“Sleep disordered breathing is a common disorder that has been increasingly associated with eye diseases. It may make the eye vulnerable due to the effect of hypoxia or it can involve pathways that lead to impaired autoregulation of optic nerve perfusion,” they note.

OSA is fairly common and occurs in an estimated nine per cent of women and 24 per cent of men between the ages of 30 and 60 years. But researchers say estimates are likely low, and that about 80 per cent to 95 per cent of OSA cases remain undiagnosed. OSA consists of repeated episodes of partial or complete obstruction of the airways during sleep. Apnoea can lead to hypoxia, hypercapnea, blood pressure fluctuations, and possible changes in ocular haemodynamics, the authors noted.

The researchers reviewed over 30 studies in the medical literature, some of which support a possible link between OSA and eye disease. Some studies, however, found the association between the two somewhat weak highlighting a need for high quality studies.

Yet, some studies are more compelling in terms of possible links and mechanisms, and would suggest the area is worth pursuing as a research direction, Graham Trope MD, a professor of ophthalmology at the University of Toronto told EuroTimes.

The review included studies investigating OSA and various eye problems including glaucoma, nonarteritic anterior ischemic optic neuropathy, visual field defects, and papilledema.

“The effects of OSA on body homeostasis provide insight into how OSA can play a role in the pathogenesis of ocular dysfunction. The immediate physiological effects of OSA involve hypoxia, hypercapnia, and inspiratory effort. These factors may directly impact the functioning of the optic nerve or work in concert to manifest as vascular sequelae,” the authors wrote.

From an ophthalmology perspective there are some studies that have made it a much less frequent occurrence,” said Dr O’Brien. Treatment involves topical or systemic antibiotics, sometimes with ceftraxime or cefotaxime.

OphthalmoLOGISTS need to be able to differentiate between the various types of preseptal and orbital cellulitis so that these patients can receive effective treatment. Proper diagnosis of the condition can be difficult, however.

“Navigating the course of the patient who presents with inflammation of the eyelids can be quite challenging” said Terrence O’Brien MD, speaking at the annual AAO meeting. Dr O’Brien is a professor of ophthalmology at Bascom Palmer Eye Institute in Palm Beach, Florida. He recommended that physicians zero in on the most distinctive signs, generate a differential diagnosis, consider other findings, and perform laboratory studies before initiating therapy.

The first step, he said, is to check the eye for inflammatory proptosis. If present, the patient should be evaluated for preseptal cellulitis; if absent, the patient should be evaluated for orbital cellulitis. Each of these conditions has its own treatment plan.

Preseptal cellulitis

Preseptal cellulitis refers to infection of the soft tissue of the eyelids and the periorbital region anterior to the orbital septum. The condition can lead to hyperaemia of the skin, distension of the eyelids, and conjunctival ecchymosis.

Preseptal cellulitis may occur in a post-traumatic, suppurative form, or in conjunction with dermatobacteriitis. There is also a non-suppurative form that occurs in children less than six years old.

When faced with a case of post-traumatic suppurative preseptal cellulitis, the ophthalmologist should send a culture to a biology laboratory so that the infectious agent can be identified and susceptibility can be determined. Most cases are caused by Staphylococcus aureus or Streptococcus pyogenes. Treatment involves incision and drainage of the preseptal suppuration, culture of the purulent material, and intravenous nafcillin or oral cloxicillin.

Dermatobacteriitis and preseptal cellulitis, which also may also be caused by Staphylococcus aureus or Streptococcus pyogenes, should be treated with culture of skin lesions and intravenous nafcillin or oral cloxicillin.

Non-suppurative preseptal cellulitis in children is most often caused by Haemophilus influenzae type B or Streptococcus pneumoniae.

“This used to be a common presentation, but now, widespread use of the Hib vaccine has made it a much less frequent occurrence,” said Dr O’Brien. Treatment involves topical or systemic antibiotics, sometimes with ceftraxime or cefotaxime.

Orbital cellulitis

Orbital cellulitis refers to infection of the soft tissue within the orbit, posterior to the orbital septum.

“This is one of the true ophthalmic emergencies. This is in the danger zone... and it can lead to significant morbidity and even mortality,” said Dr O’Brien.

He said that orbital cellulitis requires an aggressive approach to diagnosis and management, with immediate orbital imaging. Predisposing factors in orbital cellulitis include the proximity of the nasal sinuses

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Strabismus not just a paediatric problem

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Strabismus often referred to as a paediatric problem
may not be referred for treatment in adults because of a common
misperception that the surgery in adults is purely cosmetic. But correcting problems
such as double vision and misaligned eyes can improve function, decrease disability, and
improve quality of life.

Indeed, there are several eye muscle problems that can be misinterpreted, and end up being thought of as needing treatment or a therapy that turns out to be inappropriate, said Stephen Kraft MD, from the University of Toronto. At the recent annual Crawford Day conference at the Hospital for Sick Children he presented several examples of strabismus conditions that fall into these categories.

Take, for example, a patient who cannot abduct one eye.

"The most common thing people think about is a sixth nerve palsy which can be a serious problem, but there are certain features that can lead to a diagnosis of congenital Duane Retraction Syndrome (DRS) instead," he said.

DRS has key features that don’t appear in sixth nerve palsy: One is retraction of the eye into the eye socket when the patient tries to look in the direction away from that eye, the eye itself begins to retract into the socket. This is because there is a misalignment – the lateral and medial rectus muscles get stimulated at the same time.

Along with this is a narrowing of the eyelid fissure.

DRS is generally present at birth. So, another aspect of diagnosis lies in the history. If the patient has had the problem since birth or infancy, the condition hasn't changed, and there is retraction of the eyelid, then think DRS, Dr Kraft said.

A second problem that may present in the ophthalmologist’s office is a patient who has trouble reading and gets eye strain because they have convergence insufficiency. These patients are usually treated with eye exercises to promote strengthening of the up-close efficiency of focusing. But, in some adults, the exercises don’t work. "The reason is that the examiner has forgotten to check the patient's focusing range," Dr Kraft said.

If the near-vision focus is not normal, the first treatment isn’t eye exercises but rather reading correction.

"Sometimes by helping the reading and making it more efficient and clear, the problem of convergence can actually take care of itself," he said.

And the reading problem doesn’t always happen in just patients who are over 40 – check younger adults with this complaint too. O nce patients have their new glasses, wait and see if the exercises are still needed later, he advised.

Double vision issue

Then there are issues relating to double vision. Appropriate use of tests and asking the right questions are the key to making correct diagnoses.

Dr Kraft has seen patients complain of double vision – coincidently after they received new glasses with a strong prescription. For these patients, the problem could be the glasses themselves. If glasses aren’t centred properly, a prism effect can be produced which creates an unstable eye alignment. For patients with strong prescriptions, check the centring and design of the glasses first, he said.

Some patients seeing double might have the problem in only one eye. Monocular diplopia can be due to any of several causes ranging from an early cataract, corneal scars, keratoconus, astigmatism, or more. W ith patients who complain of double vision, ask whether it’s in one eye or both, and test the eyes separately and together, he said. If the problem is in one eye, it’s not a muscle problem.

Then there are the patients who tell an eye examiner they see double, the examiner doesn’t see anything wrong and so refers the patient to an ophthalmologist. Asking the right questions can reveal the patient has simply noticed a normal phenomenon – the fact that objects beyond or in front of an object you focus on appear as double.

Patients with trauma to the eye are a whole other story. A common problem is double vision that occurs when the patient tries to look up – supraduction. Caused by an orbit fracture, the eye muscle below is bound.

"Ophthalmologists often forget that if you have trauma to the socket, you can also physically damage the muscle that helps you look down. It can be traumatised at the time of surgery, or secondarily be affected by the surgery to correct the fracture in the socket," Dr Kraft said.

Problems looking down can be far more disabling to a patient than the upwards problem since it can affect everything from reading to being able to safely navigate walking up or down stairs. It’s a problem that needs to be kept in mind, and patients should be warned of it as a potential problem from surgery.

"N ature takes six to 12 months to heal these transient palsies. Some will get better, some won’t. Surgical intervention shouldn’t be done for at least six months to allow for spontaneous recovery," he said.

Then there are adults who had surgical correction for crossed eyes in infancy. These people might go in for testing Muscle testing reveals that the eyes have a tendency to cross, and the patient might have surgery recommended. Yet, many of these patients don’t need surgery.

W hy? Because an overly aggressive muscle test will show what the eyes do at extremes, but not that the patient actually has normal function when the eyes are allowed to work together.

"If you use a cover and prism to see how their eyes turn too aggressively, you can actually disrupt the binocular vision and the eyes can cross a certain number of degrees."

O ther risk factors for orbital cellulitis are sinusitis, diabetes mellitus, and immunosuppression.

As with preseptal cellulitis, signs of orbital cellulitis include hyperaemia of the skin, distension of the eyelids, and conjunctival inflammation. In addition, orbital cellulitis may cause orbital pain (which Dr O’Brien called the “hallmark” of the condition), proptosis, and limitation of ocular motility.

Exogenous orbital cellulitis should be managed by culturing the purulent material and administering intraocular antibiotics, intravenous tobramycin, or both.

W hen sinusitis is the underlying factor in orbital cellulitis, the most common organisms are Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenzae, and non-spore forming anaerobes.

Dr O’Brien said that orbital cellulitis with sinusitis often requires collaboration with otorhinolaryngology to obtain material for smear and culture, and then to initiate high-dose therapy with intraocular ceftriaxone.

He also warned ophthalmologists to be suspicious of the possibility of mucormycosis if diabetes mellitus, immunosuppression, or orbital apex syndrome are present. Mucormycosis requires a mandatory biopsy for histopathology and culture, and high-dose intravenous amphotericin B.

Dr O’Brien reminded ophthalmologists to be alert to the signs of caeruinosus sinus thrombosis: rapid progression of orbital congestion; high fever, nausea and vomiting; hypotension of maxillary division of the 5th nerve; retinal venous engorgement; and the development of contralateral orbital congestion.

Finally, he emphasised the high prevalence of infection in orbital cellulitis.

"When you’re doing a differential diagnosis of proptosis, infection should be considered at stages one, two, and three," he said.

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